ASBPE Magazine of the Year 2006

YOUTHFUL THINKING
Gartner tells IT to watch where the young are taking technology. PAGE 14

NO TIME TO LOSE
Columnist Virginia Robbins offers six steps for getting back on track if you fall behind in your work. PAGE 25

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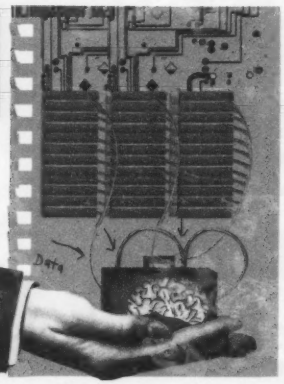

MICHAEL WOHLENSTERN

Get the freshest tips and techniques for keeping your backup environment healthy.

Page 27

Alaska Dems Battle State Over E-voting

Party says changes were made to voter database after '04 election

BY MARC L. SONGINI

An examination of the e-voting database and its audit logs from the November 2004 general election in Alaska found that changes were made to the database in the months after the votes were tallied, according to the state's Democratic Party.

The party contends that a study of the electronic voting database, which it obtained a copy of last month after a long battle with the state, revealed that the database had been accessed as recently as this July.

"The [state's] Division of Elections has not comprehensively explained and corrected the situation," said Alaska Democratic Party spokeswoman Kay Brown.

The logs were generated by Diebold Election Systems' AccuVote-OS optical-scan voting systems, which were used statewide in the election.

The party had sought a copy of the AccuVote voting data-

Alaska E-vote, page 16

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THE ASSOCIATED PRESS

Ohio University was hit by five security breaches that came to light last spring, leading to an overhaul of the school's IT department.

Panel Advises OU to Rehire Fired IT Execs

Grievance committee criticizes CIO, says blame for breaches misplaced

BY TODD R. WEISS

A grievance committee at Ohio University is recommending that two top IT managers who were fired in August following a series of data breaches should be rehired and receive public apologies for their dismissals.

In a three-page letter dated Oct. 1 that was obtained by *Computerworld*, the grievance committee also criticized outgoing CIO William Sams for not recognizing and addressing serious problems within OU's IT organization before the security breaches were discovered last spring.

Sams pinned the blame for the breaches primarily on the two fired IT managers, saying in their termination notices that they should have done more to secure the school's systems.

But in its letter, the grievance committee stated that OU's formal claims of malfeasance against the two managers were "unfounded" based on the evidence presented to the panel.

The matter now is before OU Provost Kathy Krendl, who will make a final ruling on the status of the IT managers. Krendl couldn't

OU Firings, page 60

INSIDE

Microsoft patches 26 security flaws, the most ever for a single month. PAGE 6

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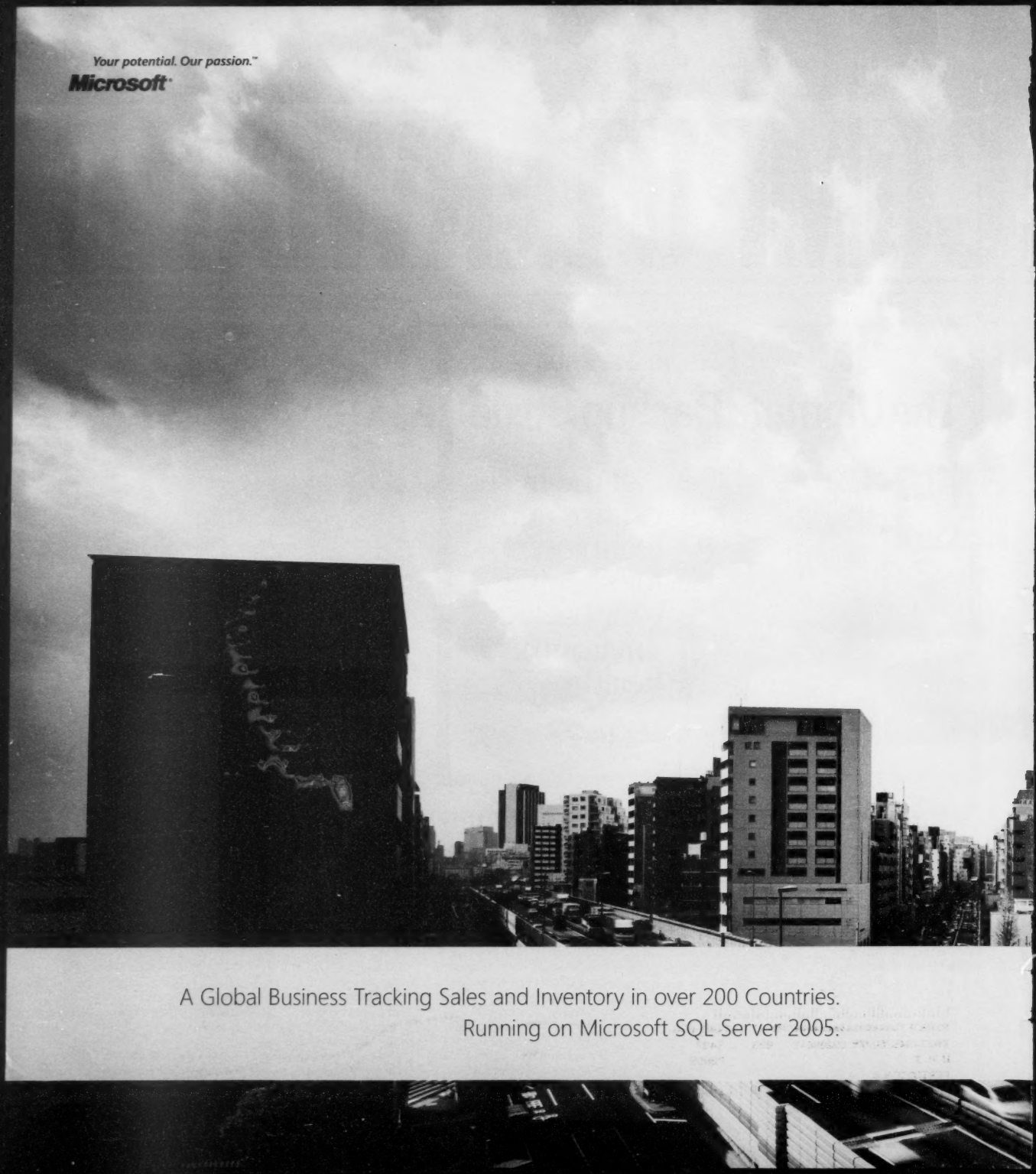

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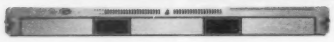

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†Storage Magazine, February 2005.

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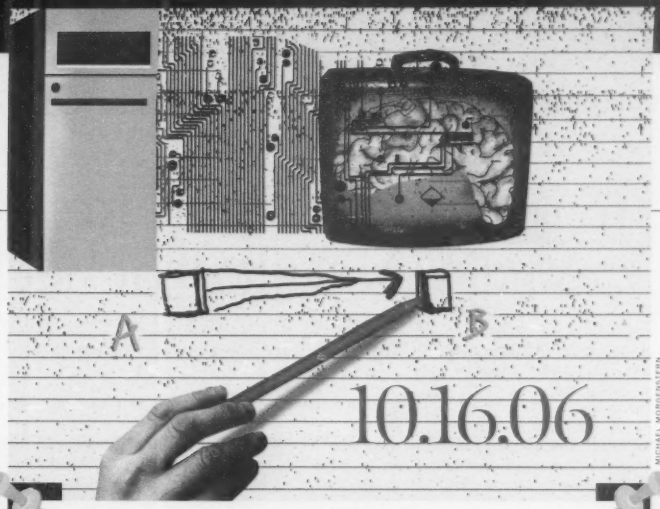
CONTENTS



NEWS

6 Microsoft issues patches for 26 security holes, the most it has ever had to fix in a single month. Also: Oracle says it will provide more info about flaws in its software to help IT staffers better prioritize their patching plans.

8 WiMax promises big increases in wireless bandwidth and lower costs, but its potential business uses are still unclear, say IT managers and analysts.

8 Ray Noorda, who died last week at the age of 82, is remembered as a pioneer of LAN technology and the man who turned Novell into the dominant networking vendor, before he overreached and tried to take on Microsoft.

14 Watch out, baby boomers: Youth matters more than ever in IT, now that the Web is becoming more interactive and technology is becoming more consumerized, according to Gartner.

16 Salesforce.com unveils tools to ease application development for its AppExchange marketplace.

18 Global Dispatches: Dutch researchers who belong to a group seeking a return to the use of paper ballots claim they've found flaws in e-voting systems used in the Netherlands, Germany and France.

20 Q&A: NYSE CTO Steve Rubinow discusses the launch of the stock exchange's new Hybrid Market trading system, Linux and the Euronext merger.

20 Force10 Networks hopes to make inroads into the corporate market with two newly released Gigabit Ethernet switches for use at the edges of networks.

21 Continental Airlines opens a disaster recovery facility in an underground Texas bomb shelter built in 1982 by a nephew of Madame Chiang Kai-shek.

OPINIONS

12 On the Mark: Mark Hall finds a vendor that says the best way to secure a stored file is to break it up and spread it around the Web.

24 Don Tennant believes you're only as old as the age you project, so don't go into job interviews expecting to be rejected because you're over 50.

24 Virginia Robbins knows that we all fall behind in our work from time to time. She says it's a good idea to ask your boss for help getting back on track.

62 Frankly Speaking: Frank Hayes eulogizes IT industry pioneer Ray Noorda, whose legacy of seeking ideas from twentysomethings lives on at Google.

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INSIDE

DEPARTMENTS/RESOURCES

At Deadline Briefs	6
News Briefs	12, 14
Letters	25
IT Careers	58
Company Index	59
How to Contact CW	59
Shark Tank	62

KNOWLEDGE CENTER STORAGE

A best practices guide to backing up data, from the desktop to the data center. **Package begins on page 27.**

SPECIAL REPORT

28 Data Centers. When you're planning out your data center backup strategy, technology is the wrong place to start. Begin with an assessment of which data and systems need to be protected and how much it will cost if they go down.

36 Branch Offices. The key to making branch backups work is to stick to a schedule that causes the least disruption to operations and normal customer business.

40 Desktops. Getting users to care about backing up their data is the first step in desktop backup strategy. And if your plan puts users on their own, be sure to educate them on storage do's and don'ts.

44 PDAs. Unlike PCs, most handhelds don't have hard drives — or anything resembling a hard drive — so a simple hard reset can wipe their memories clean. The best defense calls for frequent backups.

46 Messaging. With messaging stores growing exponentially, administrators are turning to disk-based backup technologies to manage e-mail and instant messaging communications.

50 Research Insights. Fifty-four percent of respondents to *Computerworld*'s exclusive data backup survey reported that less than half of their IT staffers are well versed in their department's backup procedures. Find other statistics on our research results page and on our Web site.

52 Workgroups. Specialized workgroups of two to 50 people need backup systems specifically designed for smaller groups, not trimmed-back enterprise-grade tools.

56 Opinion: Future Cache. For many, the disk drive has become the primary bottleneck in application performance. But things may be changing, says columnist Mark Hall.

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Information about these additional storage related resources is available on our Web site.

CONFERENCE: *Computerworld* **hosts the fall Storage Networking World conference, for IT managers, storage architects and infrastructure professionals, Oct. 31-Nov. 3 at the J.W. Marriott Grande Lakes Resort in Orlando. Find registration information and read news stories from the conference online.**

EXECUTIVE BRIEFING: The storage manager's job has been turned upside down by new technologies. Read this report to get up to date on key storage technologies and the best practices for managing them.

AT DEADLINE

Oracle Agrees to Pay PeopleSoft Fines

The U.S. Department of Justice said Oracle Corp. has agreed to pay a fine of $98.5 million to compensate for PeopleSoft Inc.'s overcharging of government customers. The DOJ said the overcharging occurred between 1997 and 2005, prior to Oracle's acquisition of the applications vendor. Oracle said that it was not aware of the suit at the time it acquired PeopleSoft and that it cooperated with the government's investigation into the overcharges.

HP Appoints Chief Ethics Officer

Hewlett-Packard Co. has hired a former NCR Corp. lawyer, Jon Hoak, to serve as chief ethics and compliance officer. Hoak's job will be to ensure that HP's businesses practices, sullied by a boardroom spying scandal, meet company standards. He will report to CEO, President and Chairman Mark Hurd until a new HP general counsel is named. Hurd was CEO of NCR before joining HP in March 2005.

IBM Procurement HQ Moves to China

IBM has shifted its global procurement headquarters from Somers, N.Y., to Shenzhen, China, a symbolic move that the company said does not indicate any upheaval in its purchasing operations. For now, the move involves the relocation of one person, Chief Procurement Officer John Paterson. He will focus first on ramping up the purchase of third-party software and services from Asian suppliers.

Microsoft Adds Communication Tool

Microsoft Corp. has acquired Colloquis Inc. and started offering the company's technology as a new Windows Live hosted service that lets businesses use digital language processing to interact with customers online. Microsoft renamed the technology Windows Live Service Agents.

Microsoft Releases Record Number of Security Fixes

Figure doesn't faze IT execs, but active exploits create a sense of urgency

BY JAIKUMAR VIJAYAN

INFORMATION technology managers last week appeared mostly unfazed by a larger-than-usual volume of monthly security patches from Microsoft Corp. and a temporary delay in the availability of the fixes via the company's automatic update services.

But the fact that at least six of the record 26 separate vulnerabilities disclosed last week are already being exploited or are the subject of proof-of-concept exploit code did make some IT managers take notice.

The presence of active exploits somewhat heightened the urgency to apply the latest patches to Windows systems at Fenwick & West LLP, according to Matt Kesner, the Mountain View, Calif.-based law firm's chief technology officer.

"It called attention to the patches and made it a little more worrisome," Kesner said. However, he added that the law firm has already implemented multiple layers of anti-malware protection to lessen its dependence on patches and mitigate the risks posed by unpatched flaws.

Concerns for the Future

The continuing emergence of so-called zero-day security threats could force Microsoft to start issuing out-of-cycle patches more frequently, said Tim O'Pry, CTO at The Hensler Financial Group in Kennesaw, Ga.

"When they went to the monthly patch cycle, it looked like a good idea," O'Pry said. But if interim patches start becoming more frequent, "we'd end up being in between where we were and where we are," he added.

O'Pry's biggest concern with such a scenario is that patches could start getting released without adequate testing, causing systems administrators more difficulties. "The problem is in deciding whether the vulnerability is worse than the potential problems" from a faulty patch, he said.

Microsoft's latest "Patch Tuesday" round of updates included a total of 10 security bulletins, six of which were given a "critical" severity rating by the company.

"We were definitely aware of the larger-than-normal quantity of patches," said Tom Robertson, senior vice president of IT at Charter Bank in Bellevue, Wash. But, he added, "we experienced no problems with testing and deployment of these patches." Nor was there any "significant" delay in patch availability, he said.

Microsoft said unspecified "technical problems" prevented it from immediately distributing the patches via its Microsoft Update, Automatic Updates and Windows Server Update Services programs.

However, the snafus were rectified after several hours. A post on the blog for Microsoft's Security Response Center said the problems involved networking issues, not the security fixes themselves.

Sixteen of the flaws disclosed by Microsoft were discovered in applications. That continues a trend toward "application-based malware and application-targeted vulnerabilities," said Monty Izerman, a senior manager of the global threat group at McAfee Inc.'s Avert Labs unit.

Izerman said via e-mail that of all the flaws, the most critical one was a Windows Shell vulnerability that could be used to take complete control of compromised systems. That flaw has already been widely exploited in so-called drive-by install and download attacks, according to Izerman. ▸

Critical Mass

Microsoft released six security bulletins that addressed critical vulnerabilities in a variety of its products:

- **MS06-057:** Remote code execution vulnerability in Windows Shell services
- **MS06-058:** Three separate vulnerabilities in PowerPoint
- **MS06-059:** Four remote code execution flaws in Excel
- **MS06-060:** Three vulnerabilities in Word
- **MS06-061:** Remote code execution flaw in Microsoft XML Core Services
- **MS06-062:** Three vulnerabilities in Office

Oracle to Provide More Flaw Info

ORACLE CORP. last week said it is taking a series of steps designed to make it easier for IT departments to assess the seriousness of security flaws in its databases, business applications and other products.

When it releases its next quarterly batch of security fixes tomorrow, Oracle will include new information about the vulnerabilities in an effort to help IT managers and systems and database administrators better prioritize their patching plans.

One of the planned additions is a new severity rating method based on the Common Vulnerability Scoring System. The CVSS is an emerging industry standard that was developed by a nonprofit organization called the Forum of Incident Response and Security Teams, and it is already backed by vendors such as IBM, Cisco Systems Inc. and Unisys Corp. It calls for vendors to give vulnerabilities a single score on a scale of 1 to 10 based on how serious the flaws are.

Oracle has previously provided internally developed risk matrices in an attempt to help customers assess the risks associated with each flaw. But the matrices are generally regarded by users as being hard to interpret and lacking in enough information to make proper risk assessments.

Oracle now will also clearly identify especially serious flaws that could allow remote attackers to gain complete administrative access to databases without any authentication, said Darius Wiles, senior manager of the company's security alerts program. In addition, Oracle will include an executive summary of the security vulnerabilities addressed in a particular software update.

The heightened disclosures should allow IT managers to make more informed judgments about how critical specific flaws are in their Oracle environments, said Robert Garigue, vice president of information integrity at Bell Canada in Montreal.

"There's nothing more frustrating than when you can't understand why things are the way they are, especially when it is around a vulnerability," he said.

"Overall, this looks like something I think would certainly help customers better deal with risk," said Rich Mogull, an analyst at Gartner Inc.

But there are some caveats, said Stephen Kost, chief technology officer at Integrigy Corp., a Chicago-based company that offers security tools and consulting services for Oracle systems.

For instance, highlighting remotely exploitable flaws could lull administrators into falsely thinking that other security holes aren't serious, Kost said. And many Oracle patches address several vulnerabilities at once, so it may make little difference in the end what CVSS rating a particular flaw gets, he added.

– JAIKUMAR VIJAYAN

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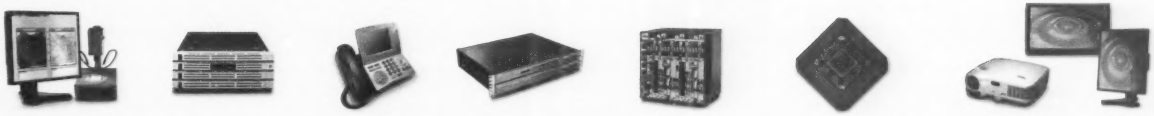

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WiMax Still in Start-up Mode For Corporate Applications

Conference attendees eye bandwidth boost but say enterprise use years off

BY MATT HAMBLEN
BOSTON

VENDORS OF WiMax products and services predicted here last week that the emerging technology will provide vastly enhanced wireless bandwidth at a fraction of the cost users now have to pay.

But IT managers and analysts, although enthralled with the promise of higher bandwidth, said at the WiMax World USA 2006 conference that WiMax's potential business applications are still mostly unclear, as are the actual costs that corporate users would have to pay for services based on the technology.

Potential Use

Roy Russell, founding chief technology officer at Zipcar Inc. in Cambridge, Mass., said he welcomes WiMax as a potential means of adding more bandwidth to the wireless self-service system through which Zipcar rents its fleet of about 2,000 cars to urban drivers.

Zipcar customers use membership cards that they scan over readers to unlock rental vehicles parked in designated on-street spaces. Membership and reservation data is transmitted via Cingular Wireless LLC's data network to devices installed in each car. The company also uses the wireless network to track its vehicles.

Russell said that with WiMax's added bandwidth, Zipcar might be able to install some kind of gateway in each car to allow customers to access the Internet via handheld devices or laptop PCs. "The broadband wireless user is our customer," he said. But he predicted that any move by Zipcar to tap into WiMax is a "long, long ways away."

The WiMax Forum trade group predicts that WiMax, which is a so-called fourth-generation wireless technology, will provide throughput of up to 15Mbit/sec. on mobile deployments and 40Mbit/sec. for fixed or portable applications. In comparison, the bandwidth of existing cellular networks based on EV-DO technology tops out at about 700Kbit/sec.

WiMax got a boost in August, when Sprint Nextel Corp. announced that it planned to invest $3 billion in the technology and start rolling out a WiMax network by late 2007. At WiMax World, Sprint Nextel CTO Barry West said WiMax will provide the network operator with cost and performance characteristics that are about 10 times better than what it gets from its EV-DO network. But Sprint has yet to say what it will charge businesses and home users for WiMax services.

High Speed, Low Cost

At last week's conference, Nortel Networks Corp. showcased a cellular base station transceiver for mobile WiMax applications that it plans to start selling to wireless carriers next year. A promotional sign at Nortel's booth on the trade show floor promised "three times the speed of current wireless networks at one-third the cost."

> **WiMax's role is still vague for the enterprise. The business models are still unclear.**
>
> **GENE SIGNORINI,** ANALYST, YANKEE GROUP RESEARCH INC.

Nortel CTO John Roese said that although the company will market the transceiver and other WiMax gear to the operators of wireless networks, it also expects to try to sell corporate enterprises on the idea of enlarging their internal IP networks to be able to handle the emerging technology.

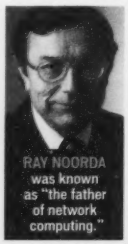
TowerStream Corp. in Waltham, Mass., already includes a WiMax offering in a bundle of broadband wireless services it provides to about 400 business customers in the Boston area. According to TowerStream CEO Jeff Thompson, WiMax is performing at an average rate of 2.2Mbit/sec., as part of an aggregate throughput of 100Mbit/sec. for the $5,000-per-month bundle.

But even with all the emerging trials, "WiMax's role is still vague for the enterprise," said Gene Signorini, an analyst at Yankee Group Research Inc. in Boston. "The business models are still unclear." Signorini predicted that widespread business adoption of WiMax remains a "few years away." ▸

Noorda Dies at 82; LAN Pioneer Led Novell During Its NetWare Heyday

BY TODD R. WEISS AND MATT HAMBLEN

Ray Noorda, who built Novell Inc. from a small company into the dominant vendor of LAN technology but then couldn't stop it from being eclipsed by Microsoft Corp., died last Monday at his home in Orem, Utah, at the age of 82.



RAY NOORDA was known as "the father of network computing."

Noorda died after a lengthy battle with Alzheimer's disease, according to a statement released by The Canopy Group, a venture capital firm in Lindon, Utah, that he founded in 1995 — a year after he stepped down as Novell's CEO.

When Noorda joined Novell in 1983, the company had just 17 employees. It grew to a peak of 12,000 workers under his leadership, fueled by the growth of NetWare and acquisitions of vendors such as WordPerfect Inc. and Unix Systems Laboratories that Noorda hoped would enable Novell to compete on a broad basis with Microsoft.

Noorda became known as "the father of network computing" and was also credited with developing the tiered software sales channel and originating the concept of "coopetition" between rival vendors.

Brian Lee, an IT instructor at ITT Technical Institute in Torrance, Calif., said via e-mail that he got his first NetWare certification when Noorda was Novell's CEO. "If you found a users group member or Novell professional during that time, you found people who really felt like they were part of the elite," Lee wrote.

But that sense has slipped away over the years despite moves such as Novell's acquisition of SUSE Linux AG, added Lee, who is an adviser to the student-run San Gabriel Valley Novell Users Group. "Novell doesn't seem to be producing any of the kind of innovation for which IT professionals are willing to overturn infrastructures," he wrote.

End of an Era

Jon Oltsik, an analyst at Enterprise Strategy Group Inc. in Milford, Mass., said Noorda was an important player in the development of the modern IT industry but had less success once Novell's heyday ended.

"Clearly, as you look at the annals of high tech, he's got to be one of the people you look at as one of the pioneering personalities," Oltsik said. "Novell was a grand-slam home run [for Noorda], but as the industry moved forward, he never reached that next milestone. It wasn't for his lack of trying."

Even so, Noorda was "one of the greats in computing, in how we transitioned from the mainframe era to the user-centric era," said Rob Enderle, an analyst at The Enderle Group in San Jose. In addition, Noorda "stands out as a person that very few people have bad memories of," Enderle said.

Allan Hurst, president and founder of the Novell Oakland Bay Area Users Group, recalled meeting Noorda at a dinner for Novell users in Boston. Hurst said he was sitting alone at a table when Noorda asked if he and his wife could join him, saying that "he'd rather sit at a regular table and get to know people" than take a seat at a table up front.

Noorda told Hurst that he enjoyed frustrating Novell's finance executives by looking at only one number that tracked financial performance per employee out of all the reports they brought him. "He felt that most people spent too much time making running a business much too complicated," Hurst said. ▸

REMEMBERING RAY NOORDA

Frank Hayes says Noorda's legacy of seeking ideas from twentysomethings lives on at Google. **Page 62**

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BRIEFS

Microsoft Releases 'Last' Vista Beta

Microsoft Corp. has released what it said will be the last test version of Windows Vista. The software was released to participants of the company's Customer Preview Program, as well as to TechBeta, TechNet, the Technology Adoption Program and MSDN members. Microsoft said it will release Vista, which has been delayed several times, to business customers next month and to consumers in January 2007.

Judge Threatens to Shutter Spamhaus

A U.S. court in Illinois threatened to shut down The Spamhaus Project Ltd. for ignoring an $11.7 million judgment against it. The proposed order follows a Sept. 13 ruling in which the volunteer-run antispam service was ordered to pay damages and stop listing an e-mail marketing company called E360Insight LLC in its database of known spammers. London-based Spamhaus has said the judgment can't be enforced in the U.K.

Oracle Buys French Integration Firm

Oracle Corp. has acquired data integration software company Sunopsis SA for an undisclosed sum. The Sunopsis products can pull data from different sources, such as databases and ERP applications, into one location where it can be used for data analysis and other tasks. Oracle plans to incorporate Sunopsis' technology in its Fusion Middleware offering to improve support for non-Oracle products.

IBM Promises 5-GHz Power6 Server Chip

IBM plans to crank up the speed on its Power6 server chip to 5 GHz, making it far faster than competing chips from Intel Corp. and Sun Microsystems Inc. When it ships in mid-2007, the Power6 will target users running servers with two to 64 processors, officials said at the Fall Microprocessor Forum last week.

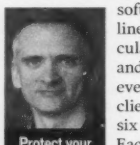
ON THE MARK

HOT TECHNOLOGY TRENDS, NEW PRODUCT NEWS AND INDUSTRY BUZZ BY MARK HALL

MATTHEW FAULKNER

Spread Your Info Around . . .

. . . the Internet to keep it secure and accessible. When you want to store important data for safekeeping, the natural inclination is to make a copy of the file and put it on a separate disk or tape. If it's vital information, you might even encrypt the file and physically lock up the media. How 20th century of you. According to Chris Gladwin, CEO of Cleversafe LLC in Chicago, even encrypted files are less secure when they're kept in one place. As many news stories have made clear, companies lose backup tapes, disk packs and even entire servers, Gladwin says. He adds that people who make multiple copies of precious files often suffer synchronization problems in determining which version is the correct one. Gladwin, who is also entrepreneur in residence at the Illinois Institute of Technology, suggests breaking data into pieces (11, to be mathematically precise) and housing the fragments around the Internet. His company oversees the Cleversafe Dispersed Storage open-source project, which has developed software that uses linear algebra to calculate how to carve up and reassemble files even if the Cleversafe client can find only six of the 11 segments. Each piece of a file is useless on its own to a data thief, Gladwin says. Plus, the software encrypts all of the data. He says the odds are astronomical that more than five of the 11 storage servers at separate Web hosting sites will fail at the same time. In fact, he claims an uptime percentage extending to 12 nines — which amounts to about an hour of downtime every million years. Sometime next year, expect to see commercial services from Cleversafe and competing companies, Gladwin says. The Cleversafe software works only with Windows and Linux for now, but Macintosh and Unix ports should be ready in 2007.



Protect your files by cutting them into pieces, says GLADWIN.

Don't monkey around when you're . . .

. . . fighting phishing sites. People who fall for such fraud can lose $500 to $1,000 on average, says *Consumer Reports*. Putting phishers out of business is a dream of Tod Beardsley, lead counterfraud engineer at 3Com Corp.'s TippingPoint division in Austin. Beardsley has released Monkeyspaw, an open-source forensic tool to help locate where phishing sites originate so Internet service providers can shut them down. In the coming months, Beardsley plans to add tight integration with CastleCops, an online antiphishing service owned by Computer Cops LLC and staffed by volunteers. Any discoveries made by Monkeyspaw will automatically be reported to the CastleCops site.

BEARDSLEY: Monkeyspaw points to phishing sites.

AJAX tool promises to clean up . . .

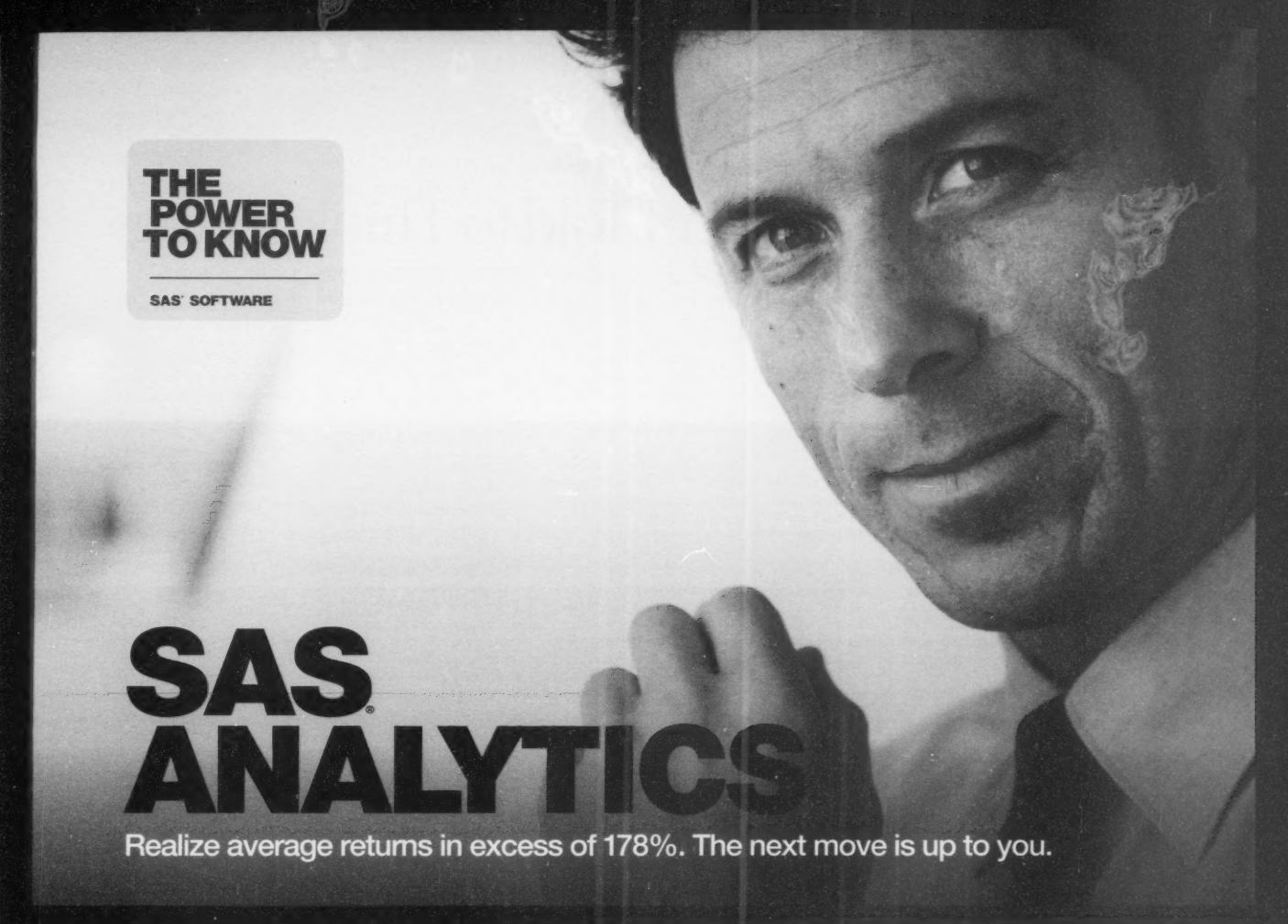
. . . user interface development. Mark Johnson, vice president of marketing and business development at Instantiations Inc. in Portland, Ore., says that Web developers using Asynchronous JavaScript and XML (AJAX) can work with lots of frameworks, such as the Google Web Toolkit. But, he says, they have few sophisticated tools beyond those frameworks. Johnson claims that his company's GWT Designer "shifts the programming model from grappling with JavaScript to using the Java development language." The tool turns JavaScript into Java source code (and vice versa) so developers can use the hundreds of Java app-dev tools and still produce an AJAX-ready graphical user interface. The tool includes a WYSIWYG developer canvas, internationalization capabilities and support for cascading style sheets. Due on Oct. 25, GWT Designer costs $39 annually per seat.

150+
Number of available AJAX frameworks listed at www.ajaxpatterns.org.

IT budget priorities shift from . . .

. . . services to hardware. Analysis by GCR Custom Research LLC reveals that IT has migrated some of its projected spending from IT services to hardware. Brian Smith, research director at the Portland, Ore.-based research firm, says that the most recent version of GCR's quarterly IT Watch survey shows a dramatic change in budget forecasts for the next 12 months. An earlier version of the rolling survey released in January found that IT execs planned to grow their services spending by an average of 7.5% and their hardware investments by 2.5% this year over 2005 levels. But a summer e-mail poll of 3,000 "IT decision-makers" revealed a shocker: Projected services growth over the next 12 months has been downsized to 3.5% on average, and hardware investments are expected to jump by 4.3%. Why the sudden shift? Smith speculates that new devices, especially for mobile applications, are the reason. He points to the top three projected growth areas — PDAs (12%), mobile phones (9%) and tablet PCs (8%). The prospect for IT services vendors, he concludes, "is much less rosy than only a few months ago."

6%
Projected growth in spending on notebook and laptop PCs in the next 12 months, says GCR Custom Research.



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BRIEFS

DOJ Approves AT&T, BellSouth Deal

The U.S. Department of Justice gave its seal of approval to AT&T Inc.'s pending $67 billion acquisition of BellSouth Corp. The agency said its review found that the proposed deal won't adversely affect competition. The deal still needs the approval of the Federal Communications Commission. DOJ lawyers said that neither company would have to sell off any networks.

Cisco Buys DSL Security Firm

Cisco has acquired the intellectual property and selected assets of Ashley Laurent Inc., a provider of software for Digital Subscriber Line gateway devices. The eight employees of the Austin-based company will join the Cisco-Linksys LLC unit. Terms of the deal were not disclosed. Ashley Laurent develops embedded software for functions such as routing, quality of service and virus protection in modems that bring broadband services into homes.

Symantec Inks Two Security Pacts

Symantec Corp. has signed agreements with VeriSign Inc. and Accenture Ltd. to strengthen its Security 2.0 strategy for protecting users from emerging security threats. Symantec has agreed to support VeriSign's Identity Protection Authentication Service and joined with Accenture to form the Security Transformation Services group to build and implement data security infrastructure and services.

$16M Invested in Wireless Gear Firm

Motorola Inc. and Deutsche Telekom AG are both investing in a maker of wireless LAN gear for distributing video throughout a home. The venture capital units of the companies led a $16 million round of investment in Ruckus Wireless Inc., whose MediaFlex system can deliver multimedia content across a Wi-Fi WLAN.

IT Managers Told to Think Young

Gartner: Youth-driven adoption of new technologies poses cultural challenges

BY PATRICK THIBODEAU
ORLANDO

YOUTH MATTERS more than ever in IT, especially as the Web becomes more interactive and heads in directions where baby boomer IT managers may be ill-equipped to lead, Gartner Inc. analysts said at the firm's Symposium/ITxpo conference here last week.

Teenagers and young adults are racing ahead of their elders in adopting new technologies and processes for collaborating, such as wikis and video sharing. And Gartner analysts said repeatedly that companies poised for future growth need to be clued in to the so-called consumerization of IT — a point driven home by Google Inc.'s agreement to acquire online video-sharing company YouTube Inc. for stock valued at $1.65 billion.

Two days after the Google-YouTube deal was announced, John Chambers, Cisco Systems Inc.'s president and CEO, said at the Gartner conference that he expects high-definition videoconferencing and unified data, voice and video communications for mobile devices to become key tools for enhancing productivity, improving contacts with customers and cutting costs.

Dennis Giokas, chief technology officer at Canada Health Infoway Inc. in Montreal, said he agrees that more-collaborative tools are needed. But he doesn't see their introduction as necessarily being dependent on cultural changes that young people may lead. For Giokas, the new approaches being touted now raise the age-old problem of change management.

"There will always be, in my opinion, resistance to change — especially if people don't see a business benefit," he said.

Terry Epp, a senior development manager at Bank of Montreal in Toronto, said the consumerization of IT is already prevalent in financial services applications such as online banking and trading.

But Epp added that he wasn't sure he agrees with Gartner's take on age issues within IT. He agreed that companies need to tap into the "up-and-coming demographic" to discover where they should be heading. But companies also need to understand why people in other age groups aren't using new services, Epp said.

A Different Attitude

However, Gartner analyst Thomas Bittman said there's more at play than the development of new technologies.

"This is not just about technology, first and foremost," he said. "It's about culture — cultural change. Although this is probably discriminatory, there is a different attitude at different ages based on what technology can provide."

The recognition by CEOs of IT's growing strategic importance in keeping up with consumer expectations is helping to push IT executives toward the top of the corporate ladder, according to Gartner. But at the same time, more CIOs are being moved closer to the exit door.

"The number of CIOs leaving their jobs doubled this year — that's right, it doubled," said Gartner CEO Gene Hall. "Why? Many CEOs believe that their CIO is cost-focused and not capable of contributing to growth — and they need IT to contribute to growth."

David Rotman, CIO at Cedarville University in Cedarville, Ohio, said he uses videoconferencing equipment to interview prospective employees. He believes that students will help drive further adoption of such technologies as they enter the workforce. "Students are using webcams to call home," Rotman said.

It seems clear to Cary Caldwell, corporate applications manager at American United Life Insurance Co. in Indianapolis, that young adults such as his 24-year-old son will want to have access to the new collaborative tools.

"When he and his buddies get into the world of business, I think they are going to demand that sort of thing," said Caldwell. "They are going to demand more services over the Web; they are going to demand things like videoconferencing versus travel."

Younger workers will learn from "what people like me have gone through over the years in terms of travel," Caldwell added. "I think you're going to see a rebellion over that sort of thing."

New Requirements

IT managers will have to embrace the following to keep up with user demands, Gartner says:

- Delivery of information to end users from various multimedia sources
- Support for interacting and networking simultaneously with numerous other users
- "Participative leadership" to de-emphasize top-down management
- Flexible IT planning that covers potential losses of control over information

Ballmer Says Microsoft Is Pushing for Simplicity

ORLANDO

MICROSOFT CORP. CEO Steve Ballmer last week said the software vendor plans to give all of its applications an "Internet-style simplicity" as part of a move to offer them in hosted environments to corporate users.

BALLMER: Free software is no threat.

The company's goal is to provide users with software that has "click-to-run characteristics" inside their firewalls, Ballmer said during a question-and-answer session with Gartner analysts at the consulting firm's Symposium/ITxpo 2006 conference here.

Ballmer discounted the competitive threat posed by software delivered over the Internet free of charge by vendors such as Google. "Most people, for the foreseeable future, are still going to want to run enterprise IT as enterprise IT," he said.

Nonetheless, Microsoft is developing its own online offerings, such as Windows Live and Office Live. Greg Barkee, director of technology at Providence Health System in Beaverton, Ore., said it will be interesting to see where Microsoft and rival vendors take the concept of Internet-based applications.

"We're still pretty fat-client-centric," Barkee said. "Anytime you can improve speed [and] efficiencies, it's a good thing, especially in the enterprise. [But] from what we continue to see, Microsoft's products seem to get bigger, fatter, [with] larger disk space and larger memory requirements."

While Ballmer talked about improving applications, one conference attendee said what Microsoft needs is improved software licensing.

"They need to get better on licensing," said S-E. Haugen, vice president of IT at Strohl Systems Group Inc. in King of Prussia, Pa. "You can't address licensing in a short session, and it's definitely nothing [Ballmer] wants to talk about, because it is a sore point."

Haugen said Microsoft's products are "sold in so many flavors and fashions" that it's hard to keep track of them. For instance, he said he has been unable to get consistent answers from resellers about license fees, such as the cost of licensing the SQL Server database to run on a Windows server with four processors.

– PATRICK THIBODEAU

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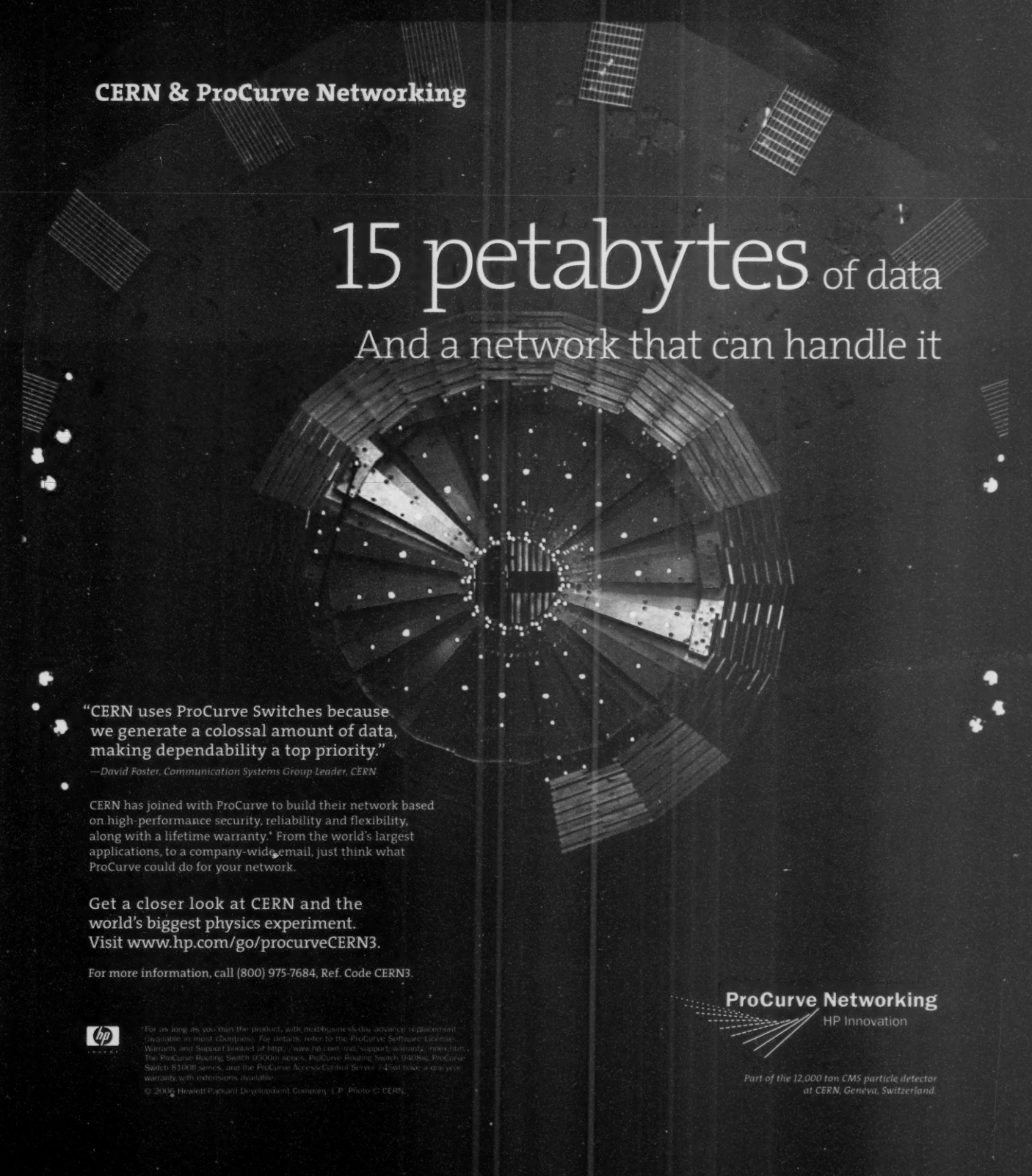

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Salesforce.com Adds Tools for AppExchange

Looks to help developers build apps to lease with its hosted CRM service

BY MARC L. SONGINI

Salesforce.com Inc. last week unveiled a new programming language and development infrastructure designed to help developers add applications to its AppExchange arsenal.

The hosted software provider announced the offerings at its Dreamforce 2006 user conference in San Francisco.

The tools, based on the language and infrastructure used by Salesforce.com's internal developers, come in the midst of a yearlong effort by the company to expand its business beyond sales and marketing services through the AppExchange marketplace.

AppExchange, which was unveiled about a year ago to host and lease software, now includes about 400 internally built and third-party-hosted business applications.

Salesforce.com said the new Apex programming language can be used by third-party developers to write code that runs automatically on its architecture. Apex can also be used by customers to customize Salesforce.com deployments, the company said.

Hosted Language

The language is hosted with the Salesforce.com service, providing developers with an infrastructure that eliminates the need to buy separate operating systems, databases, application and Web servers, and data centers, according to Kendall Collins, senior vice president of marketing at the San Francisco-based firm.

Bernie Sims, a CRM project director at Kaiser Permanente, said Apex could help the Oakland, Calif.-based provider of health care services better integrate its other applications with Salesforce.com's CRM software.

Kaiser Permanente, a Salesforce.com subscriber for about two years, has about 650 sales and account management users of the service.

At the user conference, Salesforce.com also unveiled a new program to rent office space to fledgling companies looking to develop software for AppExchange.

The so-called incubator program will provide start-up companies and entrepreneurs with a package of business services, including access to Apex, product development assistance, sales and marketing support, and business development assistance.

The program is priced at $20,000 per cubicle. The first incubator facility will open in the first quarter of 2007 in San Mateo, Calif.

The Apex development offerings and incubator program could help Salesforce.com compete with much larger rivals, such as SAP AG and Oracle Corp., by expanding the list of applications available from the company, said Rebecca Wettemann, an analyst at Nucleus Research Inc., a consulting firm in Wellesley, Mass.

The Apex platform will be available by January. ▸

Continued from page 1

Alaska E-vote

base last December to reconcile apparent discrepancies in voting results compiled by the state after the November election. The Alaska Division of Elections first rejected the request but relented last month.

Democrats had filed a lawsuit in April to force the state to release the documents. That suit remains open in Alaska's Superior Court.

Meanwhile, the state last week rejected the Democratic Party's Oct. 5 request for a copy of the database as it stood just after the election in order to determine what manual modifications were later made. The state contended that there is no unchanged version of the database.

Many Manual Votes

Brown said that experts from Black Box Voting, a Renton, Wash.-based nonprofit voter advocacy group commissioned by the party to review the contents of the database, also found an "incredibly high" number of manual votes added to it shortly after the 2004 elections.

According to the Democratic Party, the study by Black Box revealed that 293 votes were entered manually to the database between the election on Nov. 2 and Dec. 2, 2004.

While some manual entries are expected as a result of mismarked ballots, the study's total was far more than normal, the party contended. "This calls into question the certified numbers," said Brown.

Annette Kreitzer, chief of staff to Lt. Gov. Loren Leman for the Division of Elections, contended that the Black Box Voting analysis is flawed. Moreover, she said that the number of manual entries was acceptable for a large rural state like Alaska.

"We don't have anything to hide," Kreitzer said.

Brown said the study of the database did not resolve what she called huge discrepancies in the vote totals originally tallied just after the election by the elections agency. She said that two separate election reports — overall statewide results and those of individual voting districts — varied by "orders of magnitude."

For example, Brown said a tally of individual district vote counts gave President George W. Bush 292,267 votes. The statewide count, on the other hand, listed 190,889 Bush votes — a difference of 101,378. The statewide total was the official one in Bush's easy victory in the state.

Brown also said the count showed that 16 districts had a voter turnout of at least 200%.

Kreitzer said the discrepancies were caused by an erroneous counting process used by the state elections program manager. The elections agency contends that the database log proves that the 2004 statewide vote totals are accurate, according to Kreitzer.

She defended the elections agency's decision to reject early requests by the party for the database. The party's request first sought the database file structure, which included sensitive information and violated the state's contract with Diebold, she noted.

The agency declined to release the logs even after Diebold approved the request because it feared such a move might compromise the state's core IT systems, said Kreitzer.

"The situation in the state does make me worry about the integrity of the system," said Brown. "I'm a lot more suspicious than I used to be."

A spokesman for Allen, Texas-based Diebold said the company will do what it can to meet the requests of both the elections agency and Alaska's Democratic Party. ▸

E-voting Questions

The Alaska Democratic Party said that a study of the state's e-voting database after the November 2004 election found the following:

- Votes were added manually to the database for about a month after the election ended.
- Audit logs in the voting database have been accessed as recently as July 2006.
- There is no copy of the database as it stood just after the election.

New Military Voting Process Lacks Security, Critics Say

AN ELECTRONIC SYSTEM set up last month by the U.S. Department of Defense to help overseas soldiers and other military personnel and contractors cast ballots in U.S. elections lacks security safeguards, critics say.

The department's Federal Voting Assistance Program (FVAP) launched a Web site on Sept. 1 to help military personnel and civilian employees access voting information and local ballots.

The program, dubbed the Integrated Voting Alternative Site (IVAS), provides instructions for personnel on how to submit local ballots by fax machine or e-mail, said J. Scott Wiedmann, deputy director of FVAP. The ballots are not directly cast by the agency for security reasons, he said.

Wiedmann noted that the program does not provide encryption for e-mailed ballots.

The site also lets personnel download a Federal Post Card Application (FPCA) form that can be filled out to request an absentee ballot from local elections officials, Wiedmann said.

David Wagner, a professor of computer science at the University of California, Berkeley, said submitting ballots via e-mail or fax presents myriad security problems.

For example, he said, unencrypted e-mails can be intercepted and read by others. Wagner also noted that the FPCA form requires the voter's date of birth and Social Security number, which means soldiers face the risk of identity fraud by sending the form via fax or e-mail.

"No self-respecting bank would tell me to e-mail them my bank account number and Social Security number over unencrypted e-mail," said Wagner. The IVAS system ought to provide the requisite secure communications, he said.

Wiedmann said that the IVAS site offers Secure Sockets Layer encryption and that it warns voters of e-mail security concerns. He also noted that the site warns that votes may be viewed by those collecting the data.

"It's more important to these voters that they participate in the vote than in maintaining secrecy," he said.

– MARC L. SONGINI

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GLOBAL DISPATCHES

An International IT News Digest

E-voting Critics Claim to Find Flaws in Systems

GROENLO, NETHERLANDS

A TEAM OF Dutch researchers who belong to a group that advocates against the use of e-voting systems said this month that they have found security flaws in machines used in most of the Netherlands and in parts of Germany and France.

The alleged security shortcomings in the ES3B voting systems were detailed in a report that was posted this month on the Web site of an organization called Wij Vertrouwen Stemcomputers Niet ("We Don't Trust Voting Computers"). The researchers are members of the Amsterdam-based group, which has called for a return to paper ballots.

The ES3B systems were jointly developed by Groenlo-based hardware vendor NV Nederlandsche Apparatenfabriek, which is known as Nedap, and Groenendaal Uitgeverij BV, a software developer in Hilversum, Netherlands.

The report was based on a month-long examination of three ES3B machines that the report said are similar to the ones used by 90% of the voters in the Netherlands. The probe found that hackers "can gain complete and virtually undetectable control over the election results," the researchers wrote.

Nedap officials couldn't be reached for comment last week. But in a general note on its Web site, the company said it is far more difficult to manipulate votes recorded on e-voting machines than ones cast via paper ballots.

■ ROBERT McMILLAN, IDG NEWS SERVICE

GLOBAL FACT

4.39M

The number of new users of GSM technology in India during September, representing the highest monthly figure recorded thus far in that country. The total mobile user base in India is now about 127.83 million.

SOURCE: CELLULAR OPERATORS ASSOCIATION OF INDIA, NEW DELHI

Military Agency Still Stung by Support Woes

SYDNEY, AUSTRALIA

THE IT outsourcing relationship between Australia's Department of Defence and Kaz Group Pty. has hit new lows on service delivery and user-support levels, according to sources within the agency.

Despite efforts by Sydney-based Kaz to address the support problems, the sources claimed that the situation has deteriorated further since late August, when the Defence Department confirmed that there were shortcomings.

Data obtained by *Computerworld Australia* on help desk call volumes and waiting times show that support requests categorized as medium priority are taking up to six weeks to resolve.

The Defence Department inked a five-year support outsourcing deal valued at $200 million Australian ($149 million U.S.) with Kaz last year. The agency is defending the Telstra Corp. subsidiary, saying Kaz has taken steps to clear a backlog of help desk requests that escalated during a difficult start-up period.

■ RODNEY GEDDA, COMPUTERWORLD AUSTRALIA

EU, U.S. Sign New Pact On Airline Data Sharing

BRUSSELS

EUROPEAN UNION and U.S. negotiators have reached a new agreement on the sharing of personal data about passengers flying from Europe to the U.S., replacing an earlier deal that was voided by the European Court of Justice.

Finland, which currently holds the EU's six-month rotating presidency, helped broker the new agreement after the two sides reached an impasse late last month.

A spokesman for the Finnish government said the deal allows numerous U.S. government agencies to access data such as the names, addresses and credit card information of passengers. U. S. Department of Homeland Security Secretary Michael Chertoff had complained that the old agreement was hampering efforts to fight terrorism because it barred agencies other than the customs and immigration offices from accessing the passenger data.

The Court of Justice ruled in May that the earlier deal was illegal on data privacy grounds and voided it effective Sept. 30. Failure to strike a new deal would have left airlines in legal limbo. If they hadn't provided the information, they would have faced flight disruptions, fines and the possible loss of landing slots in the U.S. If they had provided it, they would have faced privacy lawsuits in Europe.

■ PAUL MELLER, IDG NEWS SERVICE

Panel Grills Finance Execs on Data Sharing

BRUSSELS

EXECUTIVES FROM the Society for Worldwide Interbank Financial Telecommunication (SWIFT) and the president of the European Central Bank faced tough questions about the sharing of private data with U.S. authorities from a European Parliament committee earlier this month.

In the wake of the terrorist attacks on Sept. 11, 2001, U.S. agencies ordered La Hulpe, Belgium-based SWIFT to give them millions of pieces of information about individuals and companies to help trace terrorism financing.

European data-protection laws forbid transfers of personal data to countries that have weaker privacy laws than European Union members do. But Francis Vanbever, SWIFT's chief financial officer, noted at this month's hearing that the messaging services co-operative for the financial industry has data storage facilities in the U.S. "We were obliged to respond to the [U.S.] subpoena," said Vanbever.

Jean-Claude Trichet, president of the European Central Bank in Frankfurt, said that the bank has no legal authority to stop SWIFT from sharing financial data with the U.S.

■ PAUL MELLER, IDG NEWS SERVICE

AT&T Creates Telecom Joint Venture in India

DELHI, INDIA

AT&T INC. last week said it will offer long-distance telephone and other networking services to corporate users in India, taking advantage of recent changes in the rules governing investments by telecommunications carriers based in other countries.

The Indian government announced a new policy last November that allows companies with foreign ownership of up to 74% to offer telecommunications services in India. Previously, foreign ownership was limited to 49%.

AT&T said that it has set up a joint venture in Delhi called AT&T Global Network Services India Pvt. in which it owns a 74% stake.

■ JOHN RIBEIRO, IDG NEWS SERVICE

Compiled by Mike Bucken.

Briefly Noted

Hutchison Essar Ltd., a provider of wireless telecommunications services, has signed an agreement to sell Research In Motion Ltd.'s BlackBerry technology in India. Mumbai-based Hutchison will offer BlackBerry handsets and RIM's push e-mail service to its subscribers. But Hutchison and Waterloo, Ontario-based RIM didn't say when the service will be launched.

■ SUMNER LEMON, IDG NEWS SERVICE

Microsoft Corp. has named Klaus Holse Andersen to replace Jürgen Gallmann as CEO of Microsoft Deutschland GmbH and vice president for Europe, the Middle East and Africa. Gallmann asked to be released from his contract because of differences with headquarters about Microsoft Deutschland's strategy, according to the company. Andersen was previously vice president of the company's Microsoft Business Solutions unit and its small and midmarket systems and partner group.

■ JOHN BLAU, IDG NEWS SERVICE

The U.S. Secret Service has signed a memorandum of understanding with Russia's Ministry of the Interior to formalize their combined efforts to investigate and prevent financial crimes. The two organizations plan to work jointly on various criminal investigations involving cybercrime, the counterfeiting of U.S. currency, credit card fraud and identity theft, the Secret Service said.

Infosys Technologies Ltd. reported a 42% boost in revenue and a 44% increase in profits year to year for the quarter that ended Sept. 30. The Bangalore, India-based outsourcer said profits totaled $199 million (U.S.) on revenue of $746 million for the quarter. Infosys forecast that its total revenue for the fiscal year that ends next March 31 will surpass the $3 billion mark.

■ JOHN RIBEIRO, IDG NEWS SERVICE

Scottish Power PLC in Glasgow said it plans to use mobile computing technology from Denver-based Blue Dot Solutions Inc. to extend its work and asset management systems to mobile devices. Scottish Power supplies energy services to more than 5.1 million home and business customers in Scotland. Terms of the deal weren't disclosed.

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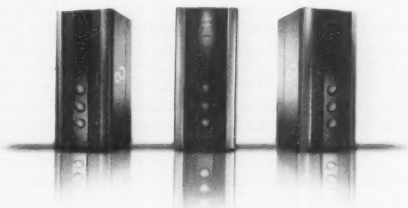

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intel Itanium 2 inside

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NYSE Launches New Hybrid Trading System

CTO Rubinow also talks about Linux and planning for Euronext merger

BY ERIC LAI

The New York Stock Exchange launched its Hybrid Market trading system on Oct. 6. The long-awaited system enables members to buy and sell a limited number of stocks electronically and to continue trading with human auctioneers on the exchange floor. The new system includes 250 software releases, 60 upgraded systems and 1 million lines of code. Chief Technology Officer **Steve Rubinow**, *who joined NYSE Group Inc. after it acquired the Archipelago Holdings Inc. electronic trading system earlier this year, talked about the state of the new system in interviews just before and just after the launch.*

How did the launch go? The Hybrid Market launch has been very successful. With trade execution times [for Hybrid Market] decreasing from an average of nine seconds to less than 0.3 seconds, our customers and the trading-floor community are using the system effectively throughout the day. We are looking to complete the rollout to all NYSE-listed securities in December 2006.

Will Hybrid help the NYSE avoid losing business to nimble electronic exchanges? We all know [that] for very good reasons, the NYSE needed enhancement, because speed historically wasn't an emphasis. Now it is. A lot of the expertise from Archipelago, where there was a huge emphasis on speed, will be injected regularly here. We don't want to have a situation where NYSE Group has both slow systems and fast systems. We want all of the systems to be as fast as the marketplace demands them to be.

How closely is Hybrid modeled on the Archipelago system you oversaw as CTO of that company? Archipelago was purely an electronic system. The attempt to achieve the proper blend of floor-based and electronic activity is unique. There is no technology that was used in Archipelago that is being used today in Hybrid. It all originates from NYSE before the merger. It is mostly HP systems, ranging from Tandems to smaller HP servers running both HP-UX and Linux, along with some IBM. We have grid technology that uses data that comes out of the NYSE systems that feeds other applications.

Did you add new technology for Hybrid? Wherever we needed more capacity, we added more servers, but we generally didn't get rid of the older stuff.

What are the exchange's plans for Linux? For every new application, we talk about the possibility of using it on Linux because of all the good things that Linux brings to the party. These are the systems that historically came from the NYSE side of the overall NYSE Group. NYSE Arca, which used to be Archipelago, uses a lot of Sun hardware, with both Solaris and Linux.

Are you working with Linux source code yet? We haven't crossed that line yet and modified the source code for our own needs. We've thought about the advantages of doing it. But once you've done it, you've committed yourself to a support depth that you don't have to do if you build right off the shelf with Red Hat Linux or Sun Solaris.

What redundancy and fail-safe mechanisms do you have in place? The same ones that the NYSE has always used. We have two data centers in the major metro area. We run pairs of mirrored redundant hardware hot in both data centers, as well as local redundancy in each data center.

Will the exchange ever move fully to electronic trading? That's not what we are doing. It will be a mix of floor and electronic trading, and our customers will determine the percentage mix. Our goal is to offer systems that cater to the needs of our entire customer base. NYSE Arca is a purely electronic system that complements the hybrid model.

How will the pending merger of NYSE Group and the Euronext exchange affect IT operations? Since the end of summer, when everyone came back from vacation, we've gotten more diligent about getting down to details. The technologists from Euronext and those from NYSE are sitting down at regular meetings and taking inventory of what we have. We all know integration takes time. Things will run independently for a while. We have some financial targets to hit, which will drive some decisions. I like things simpler, with fewer moving parts.

Force10 Looks to Push Into Corporate LANs

BY MATT HAMBLEN

Force10 Networks Inc. last week announced two Gigabit Ethernet switches designed for use at the edges of LANs, pushing itself further into competition with Cisco Systems Inc. and other vendors for corporate contracts.

San Jose-based Force10 has traditionally focused on high-performance networking equipment, often bought by supercomputing centers for research and academic uses. But the company needs to add more products for large businesses if it wants to continue to grow, said Steven Schuchart, an analyst at Current Analysis Inc. in Sterling, Va.

With last week's announcement, "Force10 has made the first step toward becoming a second-tier vendor" behind Cisco and Nortel Networks Corp., Schuchart said. But he added that Force10 is "not even close yet" to being a well-rounded networking supplier. The company still has gaps in its product line, according to Schuchart — for example, it doesn't offer any wireless products or firewalls.

Force10's new switches are the S50V, which starts at $9,000, and the S25P, which is priced at $10,000. Both are designed for use in wiring closets outside of data centers, said Steve Garrison, the vendor's vice president of corporate marketing. The S50V provides 48 copper-based Gigabit Ethernet ports and supports Power over Ethernet, while the S25P has 24 fiber-based ports and added port security features.

Tim Korb, assistant head of the computer science department at Purdue University in West Lafayette, Ind., said the school installed about 40 of Force10's older S50 switches in August in a new building that has 1,500 network ports. In addition, the building's data center includes a Force10 E300 core switch.

Cost Advantage

The S50 switches, which cost Purdue about $200,000, are the predecessors to the S50V and don't include the new line's Power over Ethernet capabilities. Korb said Purdue plans to replace the older models with the new ones, perhaps within three months.

The computer science department chose Force10's products over switches from Cisco after finding that they were about 30% less expensive, Korb said. He noted that the S50 also supports virtual LANs, which Purdue uses to separate computer science students from physical LANs so they can experiment on systems without affecting other users.

"I was concerned about Force10's size and thought that nobody would fire me for buying Cisco," Korb said. "If Force10 is in the dumper in two years, that wouldn't be too good. But I was impressed with their leadership, and I talked to people who knew them and liked them. I have to cheer them on for being so competitive."

NEW HARDWARE

Force10's new network-edge switches include:

- 48 line-rate Gigabit Ethernet ports in the S50V (pictured), and 24 fiber ports in the S25P
- Four optional 10 Gigabit Ethernet uplinks
- Switching capacity of 288Gbit/sec. for the S50V and 144Gbit/sec. for the S25P
- Support for stacking up to eight of the devices

Price: $9,000 for the S50V; $10,000 for the S25P

Airline Goes Underground for Disaster Recovery

BY SHARON FISHER

Continental Airlines Inc. this month launched a new disaster recovery operation housed in a bomb shelter built by a nephew of Madame Chiang Kai-shek, wife of the former Chinese leader. Operations began after a successful test early this month.

The Houston-based airline last October began to upgrade its business continuity and disaster recovery systems after hurricanes Katrina and Rita hit the Gulf coast, said John Stelly, managing director of technology.

At that time, the company's off-site facility was located about 20 miles north of Houston and ran on the same power and telecommunications grid as the primary IT operation, he said.

In March, Continental decided to create a disaster recovery operation in the bomb shelter and an adjacent secure building in Montgomery, Texas, about 50 miles north of Houston. Both are owned by Westlin Corp., a provider of disaster recovery services.

The bunker and adjacent complex were built in 1982 for about $30 million by Lei-chan Kung for Westland Oil, which he had founded, said Westlin President David Herr. Westland Oil went bankrupt in the early 1990s, and the property was split up into several parcels, Herr said.

The bunker facility extends 50 feet below ground and is served by a different power company and is on a different power grid than the corporate offices in Houston, Stelly said.

Successful Test

Continental signed a lease in May for 2,000 square feet of the 40,000-square-foot underground facility. It houses an Avaya Inc. S8700 IP private branch exchange and stores Hewlett-Packard Co. servers that run the mostly custom applications that will keep Continental's 375 planes flying, Stelly said.

The first full-scale operational test, during which Continental ran its entire operation from the facility for one shift, took place on Oct. 3, Stelly said.

Continental leases 12,500 square feet in an adjacent four-story aboveground building that Westland built to the same standards as the bunker. That building houses 275 Intel-based HP DC7600 workstations.

Stelly wouldn't reveal the cost of the disaster recovery operation except to say it was "a few million dollars."

Michael Dortch, an analyst at Robert Frances Group Inc. in Westport, Conn., noted that Continental has coordinated its efforts with local authorities and a local hotel to enable an adequate number of staffers to be available to run the facility in an emergency.

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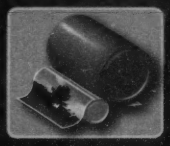

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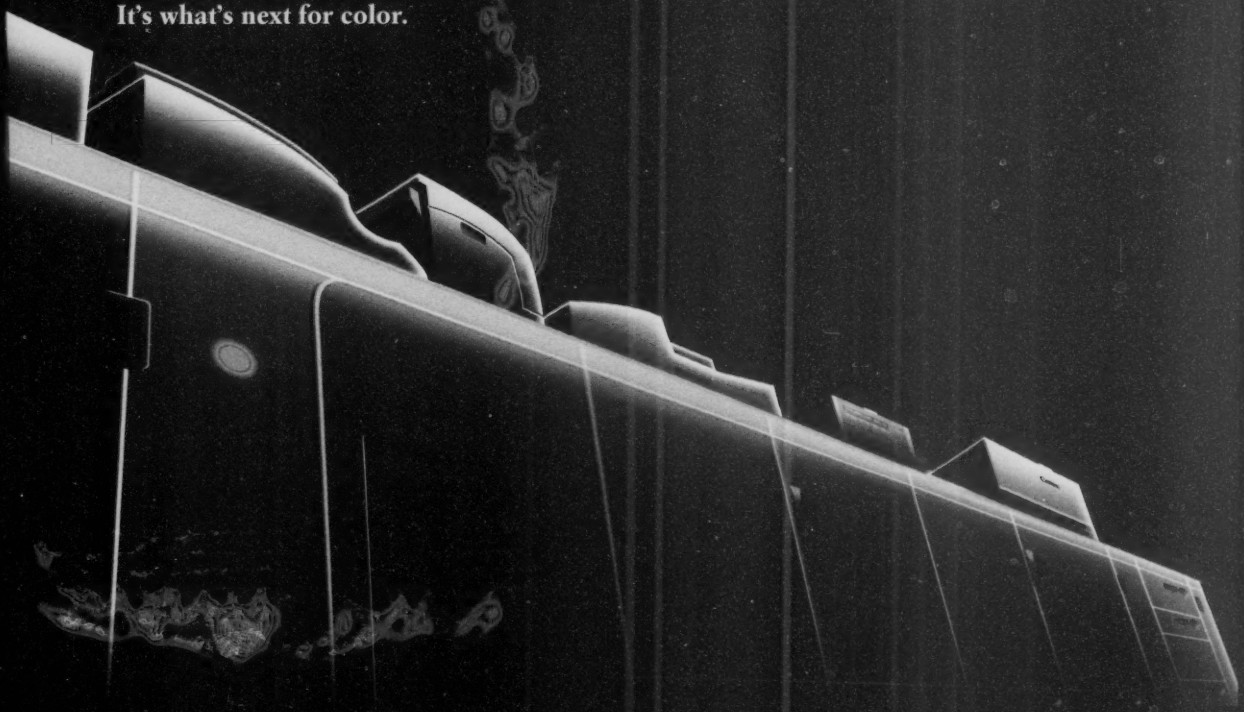

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DON TENNANT

The Birth Date Excuse

WHEN Shelly, my 15-year-old daughter, saw the cover of last week's issue, she made no attempt to hide her amusement. "Oh, wow," she laughed. "That guy is *so* you."

She was referring to the artwork that accompanied our cover story on the future of Cobol: an illustration of an older gentleman (a "geezer," as Shelly would put it) with a barbell lifted over his head. The visual metaphor — Cobol is aging but still strong — was lost on my daughter. Since I happen to spend a lot of time in the gym, she was just reveling in the opportunity to give me a hard time. I guess we fifty-somethings who work out are inherently comical. You can lift weights from now till the cows come home, some would point out, but you're still fiftysomething.

DON TENNANT is editor in chief of Computerworld. Contact him at don_tennant@computerworld.com.

Yeah, maybe. But something caught my eye last week that got me thinking about how much more there is to the age-old age question.

Reporting from Gartner's ITxpo conference in Orlando, *Computerworld*'s Patrick Thibodeau captured the thrust of a discussion on the age factor when he quoted Gartner analyst Mark Raskino. Senior IT managers, Raskino quipped, tend to be "middle-aged, sedan-driving, middle-income, middle-class, middle-of-the-road, midlife-crisis, midsized managers from the Midwest, who carry a little bit too much weight around their middles."

IT professionals would be hard-pressed to argue that they don't recognize a lot of their forty- and fiftysomething colleagues in that alliterative caricature. I wasn't there, but I can just imagine the people in the audience looking around at one another and nodding as they chuckled.

But what we in this age bracket need to get through our skulls while we still have some mottled skin covering them is that it doesn't have to be that way. We reach a certain age, and we seem to acquiesce to the stereotyping. And that's hardly a career-advancing existence.

It's not uncommon for me to receive letters from readers who recount tales of being unable to land a decent job and then blame that circumstance on having hit the dreaded half-century mark. Many note that they've been invited in for an interview with a prospective employer on the strength of an impressive résumé, only to be rejected when their age was revealed.

"Since I was over 50, it was virtually impossible for me to find a job, even after 29 years of terrific experience," one reader recently lamented, "including starting and running a company that ranked 172 on *Inc.* magazine's Inc. 500."

When I hear stories like this, I wonder if these people were really rejected because of their date of birth. Far more likely, I suspect, if age was a factor, it was in the sense that they simply came across as being old.

Employers of IT professionals have little reason to give a rat's tail about what your age is on paper. But recognize that no one is going to be keen to invest in someone who lacks the exuberance and vitality that drive innovation, creativity and resourcefulness and that are more typically associated with youth. An IT pro whose demeanor and physical appearance suggest he's tired, worn and on the verge of being burned out is unlikely to be particularly marketable, no matter how experienced he is.

It's time we fiftysomethings stopped using our birth dates as an excuse for our inability to attain what we want for ourselves and our families. Frankly, nobody wants to hear it.

If that causes you any frustration, try going to the gym and working it off.

Don Tennant

"YOU KNOW, IF I LEARN SOME NEW TECHNOLOGIES, IT WOULD HELP ME PRODUCE MORE LETTERS DECRYING THE LACK OF JOB OPPORTUNITIES FOR OLDER IT WORKERS."

VIRGINIA ROBBINS

No Time To Lose

THE BUILDING my company is located in has been nearly empty except for us, but lately it's been filling up with new tenants. Each of these new arrivals has needed to make improvements, and so our workdays of late have been punctuated by the sounds of offices being built, walls being put up and support infrastructure being installed. You almost get used to the noise that nail guns make after a while, but the day they drilled cores for the new power and cabling was miserable.

That was the day that our external auditor needed to complete his internal interviews. Just minutes after he got started, the core drilling began. The sound of the drill grinding through the cement in the floor above us unnerved us all, but this poor man looked to be in agony. His tooth was reverberating along with our walls, and then the pain shot into his jaw. He tried aspirin, Advil and Tylenol, but nothing could numb the pain. We considered offering him a glass of wine (this is Napa, after all) but decided against it. His firm allows its employees to take painkillers, but alcohol is off-limits during business hours.

VIRGINIA ROBBINS is a former CIO and is now chief operations officer at North Bay Bancorp in Napa, Calif. Contact her at vrobbins@sbcglobal.net.

You could say that our auditor was experiencing growth-induced pain. And while it may not be as palpable as it was that day with the drills whining overhead, we all feel the pain that growth can bring. As the volume of work that we must deal with rises, it can be painful to keep up. You make decisions one day to buy new equipment or develop new software, and by the time the equipment arrives or the software is finished, you realize that you're only able to meet the now-superseded needs of a few months ago. Processes that were adequate last year are no longer sufficient this week. So you

start to overengineer things, but how far can you go? Overbuilding can cost too much — your friends went bust in the dot-com boom — but lost or underserved customers can be costly too. Inevitably, your hours grow longer as the pile of stuff you need to get around to grows taller. One day, you come in early to get a jump on e-mail only to find second and third requests for items you don't remember receiving a first request for. You need help. But how do you ask for help when you don't even have time to go to the bathroom? These are the steps I've learned to take:

1. Stop. Think. What is the most important work that is not getting done? What work will cost your company, your boss and your department the most money? What is the one thing that you are always telling yourself you must do today but never get around to?

2. Write it all down. Then walk away. The next day, circle the top 25% — those items that cause you to lose the most sleep. Figure out how you would resolve these things and write a brief proposal. Include the costs and a realistic plan.

3. Tell your boss. It's time to share the pain. He probably suspects that you haven't kept pace, but as busy as you think you are, he's busier (or at least that's how he feels). Send him the document ahead of time, but don't be surprised if he doesn't read it. Make the meeting short; tell him you're concerned about your ability to succeed and how this will affect him — not you, but him. Get a commitment from him as to when you should follow up. Talk to him about contingency plans and what deadlines are approaching. While it is best, as I said, to keep the meeting short, he should know these details.

4. Listen to your boss. He'll want to halt some projects. If you don't agree, ask him to explain and tell him what will happen if you do as he requests. He may ask that you look at a problem differently. Again, listen.

5. Follow up with your boss. He may need a grace period before he can respond. He may need to speak with his boss to get you help.

6. Finally, execute on all of his recommendations.

By going in prepared, you can come out with your boss's help to get to a great place and back on track.

WANT OUR OPINION?

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www.computerworld.com/columns

READERS' LETTERS

Workplace Realities

IN THE "Discarded and Demoralized" article of Aug. 28, writer Thomas Hoffman should have pointed out that being replaced by an H-1B visa holder is a clear violation of federal law. You can hire a person with an H-1B visa if and only if you cannot find a qualified person already allowed to work in the U.S. Since, in the case cited in the story, the new visa-holding employee needed training by the outgoing employee, I doubt you can argue he was more qualified for the job.

Kingsley L. Smith
Senior software engineer,
Bruker-AXS Inc.,
Madison, Wis.

ONE PERSON is quoted as saying, "Now, I'll do my 50 and not make myself sick." What happened to the 40-hour workweek? Is 50 the new norm? If this is the case, then the U.S. professional labor force is in serious need of some kind of unionization.

Jay Seiler
Systems engineer,
Freeport, Maine

THE SUBTITLE of your article says it all in one phrase: "IT workers who have been victimized by layoffs." As I read the article, I saw people who took no responsibility for their situation but just talked about how hard the layoff was on them.

As a person who was laid off during the dot-com bust, I sympathize with how hard things are for those people. But I think the victimization is deplorable – these people need to take charge and move along. The tone of your article continues to justify a culture of victimhood. If I could pass along one message to all these people who got laid off, it would be, "Get used to it." The industry and economy aren't going to get easier, or less harsh.

Tim Luke
Senior project manager,
Newport Beach, Calif.

The Laid-Off Worker: Defeatist or Realist?

I BELIEVE THAT in his Sept. 4 editorial, "Disturbing Defeatism," Don Tennant made two errors in how he read the comments of what he terms "defeatists," who had been featured in the Aug. 28 story "Discarded and Demoralized."

The first is in his understanding of the remarks he chose to quote. These folks have not withdrawn from the compact of a full day's work for their pay. Indeed, Tennant quoted one who is putting in "only" 50 hours instead of 60 or 70. These people had given themselves emotionally to an organization with an enthusiastic belief in reciprocity. Now they have come to the end of that expectation and understand that providing extra effort to the employer does not result in concomitant commitment to them in a predictable and reliable manner.

The second error is that of aggregation. I would bet these "defeatists" had worked in large corporations. In that case, why should their attitude be otherwise? I was told repeatedly, in three large organizations from which I was laid off in cost-cutting initiatives, that I have to own my own career and not count on the company. I worked longer hours "to help the firm in this hard time," only to see benefits continually reduced and colleagues let go. We were told in numerous "town hall meetings" that the bottom line drives the organization's decisions and that cost cutting manages the bottom line. Quarterly income reviews and stockholder expectations translate into staff reductions. That is reality.

I finally learned the lesson. I left a corporation that tried hard to keep me with extra incentives. I moved to a small, private firm. It pays somewhat less and can't guarantee security – no one can – but it does guarantee that it will look at the long term, be open and honest with me, reward my efforts according to my contribution to the organization and make every effort to retain me. I now work as hard as ever, if not harder, but with a much healthier attitude.

Those "defeatists" Tennant quoted are yesterday's enthusiasts and today's realists.

Brant Serxner, PMP, MA
Manager of project management office, GeoAnalytics, Chicago,
bserxner@speedsite.com

ATTITUDE IS EVERYTHING in the workplace. I was laid off four years ago from one of my first professional jobs in IT. It was one of the toughest experiences I'd ever been through, but it taught me a couple of lessons.

First, love your job even more. If you aren't passionate about what you do, you're in the wrong profession.

Second, keep emergency funds on hand. There's nothing worse than losing your job if you've been living paycheck to paycheck. Having three to six months of living expenses makes the blow of losing your job easier to take.

Third, pay attention to your employer's situation. Keep an eye on earnings information and what's happening with upper management.

Fourth, if you are laid off, be pickier about the next employer. That doesn't mean you should shoot for a professional couch-tester position, but you should take stock of what your talents and professional passions are and go for a job that will return what you put into it.

Fifth, no one advances in a company by being negative and defensive. So, you've been laid off? Does that mean every company will lay you off? No. But come to work every day with an attitude that says, "Screw this, I'm not gonna work any harder than I want to," and you won't have to worry about being laid off; chances are your firing will take care of that fear for you.

Everyone will inevitably have bad experiences. Either take stock in your ability to recover and rise above bad situations, or be a victim for the rest of your working life – it's as simple as choosing one perception over another.

If I had not been laid off from my old job, I would not have the job I have today. I wouldn't have been able to finish my degree and finally obtain management experience. Defeatism? Not here!

Doug Sirek
Lincoln, Neb.,
d_siroco@yahoo.com

AFTER READING the column, I felt compelled to offer some biblical advice: "Do not judge, or you too will be judged. For in the same way you judge others, you will be judged, and with the measure you use, it will be measured to you" (Matthew 7:1-2).

Try to imagine the loss of your income and health benefits. No severance package. Then try to imagine that you have been told that you are worthless, from someone who days before had said the opposite. You're separated from your co-workers.

Now please go back and reread those quotes. You may see something you didn't see before (as I often do in these types of situations).

John Russo
IT specialist,
North Haven, Conn.

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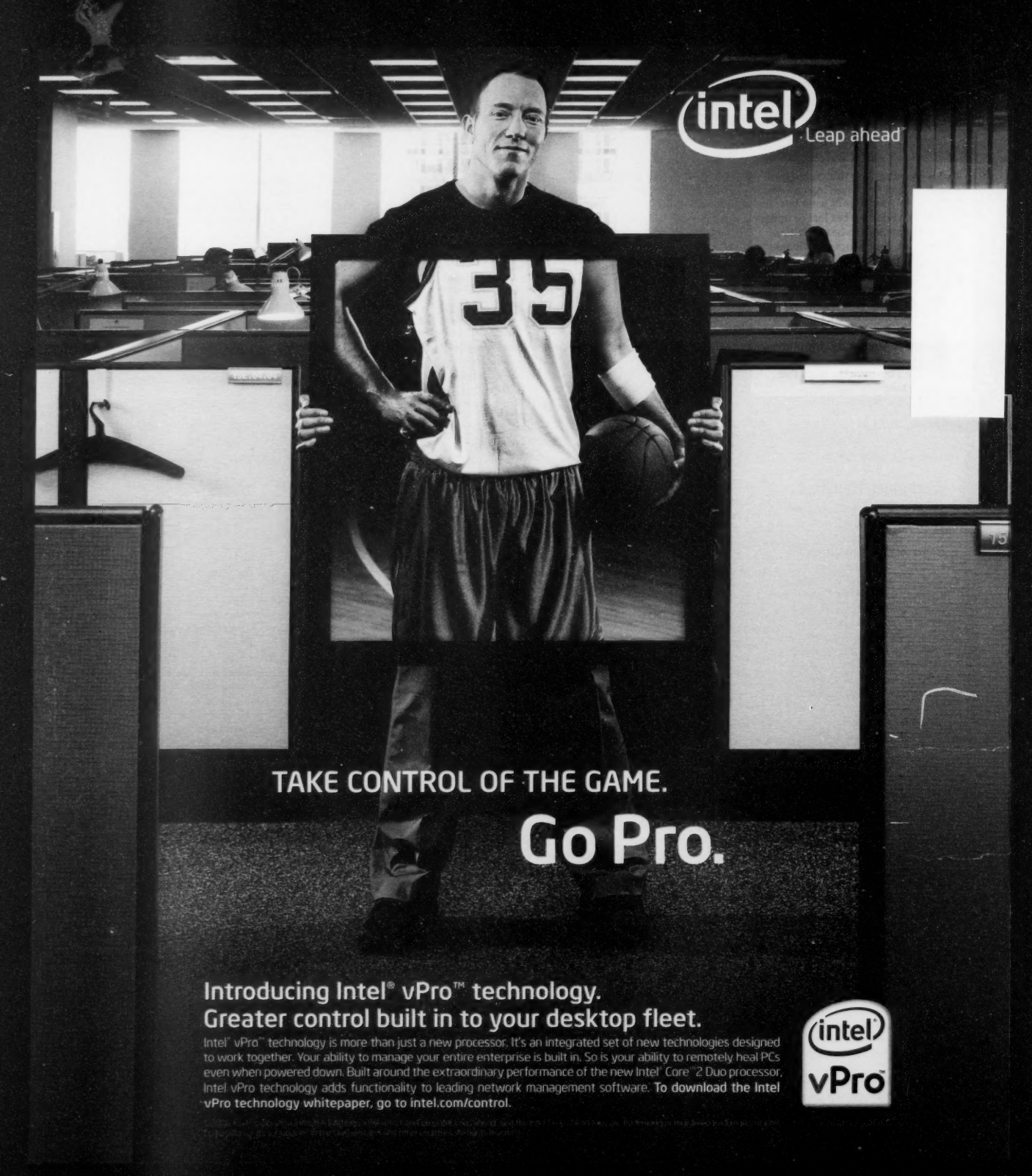
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KNOWLEDGE CENTER STORAGE

10.16.06

Backing Up Your Data Center
Determine your recovery priorities, then work backward to meet your goals. And don't trust your tape. PAGE 28

Backing Up Your Messaging
Timing is everything. Keep critical e-mail systems up and running, and take frequent snapshots of messaging data. PAGE 46

OPINION
Future Cache
For many, the disk drive has become the primary bottleneck in application performance. But things may be changing, says columnist Mark Hall. PAGE 56

EDITOR'S NOTE

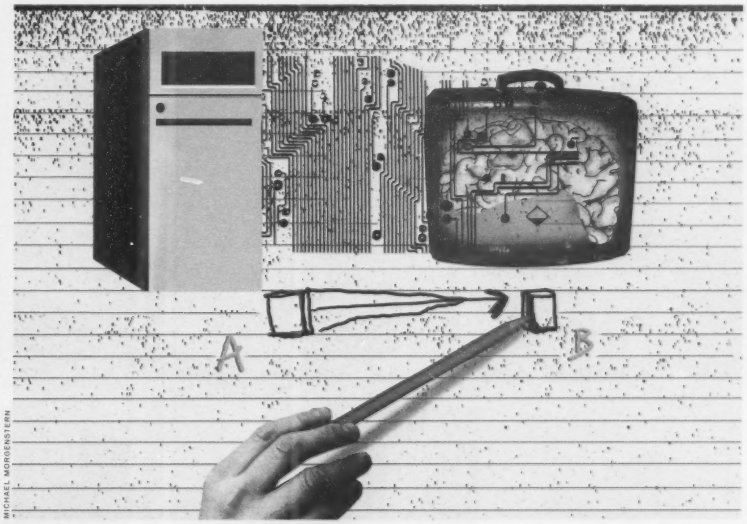
IT'S PROBABLY QUITE EASY for you to imagine a scene where a piece of your backup scheme malfunctions, zapped by a systems failure, human error or natural disaster, and some of your company's data is lost. You've likely run that possibility through your head a few times, maybe a few dozen times. And maybe it's happened a few times, too. It's that possibility, and fear, that motivates you to be diligent about your backup and restore procedures, keep management aware of the costs of protecting data and warn users of the dangers of inattention. It's a daily challenge.

Happily, most IT executives we polled are comfortable with their data backup strategies — 91% said they are flawless or experience only occasional hiccups. Yet there are gaps, and, according to experts, plenty of mistakes are made.

Nearly one-third of respondents to our survey said their company's backup procedures aren't documented, and a majority said less than half their IT staffs are well versed in the department's backup procedures. And a few readers reminded us that even with careful planning, plenty of things can go wrong. Mother Nature and inept technicians can demolish data in a split second (see "Backups Gone Badly," page 34).

It's your most critical information. It's your business. So we've put together a guide to backing up data in six key areas of your IT infrastructure. We've included the tried-and-true techniques and the latest technologies for backup. We hope you'll read this guide, save it and refer to it in the future. And like your stored data, this guide will be there again and again, whenever you need it.

Ellen Fanning is special projects editor at Computerworld. *She can be contacted at ellen_fanning@computerworld.com.*

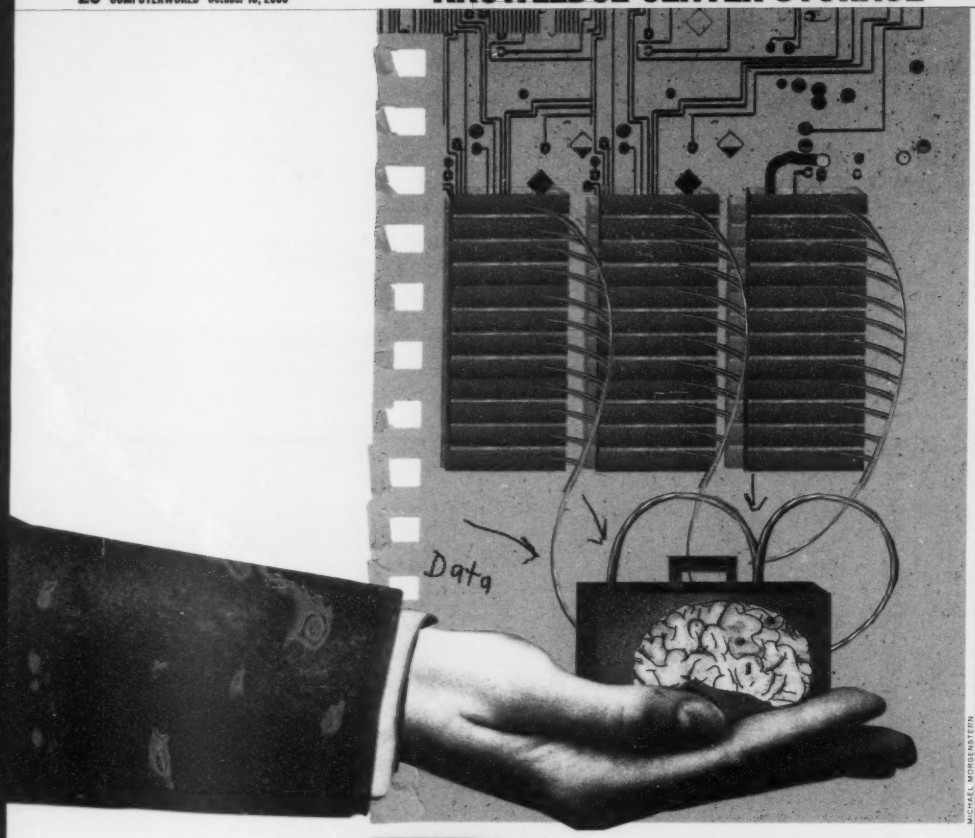


MICHAEL MORGENSTERN

The Ultimate Backup Guide

SPECIAL REPORT

Best practices, from the desktop to the data center



MICHAEL MORGENSTERN

Data Centers

Determine your recovery priorities, then work backward to meet your goals. And don't trust your tape.

By Drew Robb

THE VATICAN spent 20 years and several million dollars restoring the Sistine Chapel frescoes, one delicate piece at a time. Done incorrectly, data restoration can be just as painstaking.

"The old method — creating full-tape backups, doing a full restoration of the system and then a full restoration of the data — is slow and painful," says Dorian Cougias, CEO of Network Frontiers LLC, a consultancy in Oakland, Calif., and co-author of *The Backup Book* (Schager-Vartan Books, 2003).

Just look at some recent litigation. The costs for restoring 72 e-mail tapes in the 2005 *Zubulake v. UBS Warburg* employment discrimination case came to $166,955. Some of the key e-mails were missing from the tapes, leading to a $29 million jury verdict. In 2005, Morgan Stanley was hit with a $1.45 billion judgment after it overwrote some archived e-mails and had trouble processing backup tapes containing others.

But even if you aren't dealing with billion-dollar lawsuits, the quality and speed of backup and restoration determines business continuity, employee productivity and business survival

Continued on page 30

Security

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Continued from page 28

when faced with disasters such as a hurricane, blackout or server crash, or an employee accidentally deleting a file. And then there are regulatory requirements. Companies are taking data protection dictates seriously by adopting disk-based backup technologies at a fast pace. Research firm IDC in Framingham, Mass., says the worldwide market for disk-based data-protection hardware and software will hit $8 billion this year and reach $50 billion by 2010.

But protecting data takes more than buying a product. It remains very much a strategic decision. Here's how to set up a data center with backup and restoration in mind.

Set Recovery Requirements

There are numerous technologies and thousands of products available for backing up data. But most experts say technology is the wrong place to start looking.

"The problem that most organizations have is they are not asking the right question," says Cougias. "We back up data to protect the continuity of our systems and our data."

The place to begin, he says, is with an assessment of which data and systems need to be protected and what the cost would be if they were to go down. The ideal, of course, is fully redundant systems so service is never lost. Next best is to quickly restore data when a problem occurs. However, not all data and systems require the same level of protection.

"You have to have a good alignment between what is the risk to the business vs. the cost," says Robert Stevenson, managing director of TheInfoPro Inc. in New York. "Business units and the storage teams need to work out the recovery solutions that provide the most value based on what is at risk at the time of failure."

Once priorities are set, work out in a backward sequence the steps needed to achieve that level of availability. Generally, you should look at two metrics: recovery time objective (RTO), which is how long a particular machine or service can be down, and recovery point objective (RPO), which describes how current the restored data must be and how often a backup must be done.

"What people should do, but often don't, is start with the recovery requirements," says W. Curtis Preston, vice president of data protection services at GlassHouse Technologies Inc., a storage consultancy in Framingham, Mass. "Determine RPO and RTO, then you can figure out the backup to meet that."

Cougias notes, however, that most organizations have trouble defining what their systems consist of. Take the case of SAP technologies. If a company backs up the server running SAP applications and databases and omits backup of the workstations and subapplications tied to it, the SAP systems won't work properly once restored.

"There are two types of backups — backing up data and backing up documents," Cougias says. "Backing up files and database records is easy. Backing up data means backing up all those things that make the system work."

This includes the system state on Windows machines, Active Directory or Open Directory privileges, and configuration files for a RAID array. So you must define which devices belong to which system and the exact configuration for each system (and where it is stored), and only then figure out how to protect it.

"Backing up data means I have to get this box or set of boxes talking to each other before I can ever launch a document or write a report," says Cougias.

Further complicating the matter is the fact that restored data often runs on different hardware than what is used at the primary data center. Whether done locally or at a remote facility, restoration must be tested on the equipment that will actually be used.

"You should conduct tests of the restore/recovery process using people who have never seen the plan and don't have a clue as to its contents," advises John Weinhoeft, who recently retired from the state of Illinois central computer facility, where he was responsible for system design and a 16TB disk storage environment serving 100 agencies. "If they can do it, the plan is good."

Trials of Tape

Tape storage has been around for half a century, and it's the backbone of many backup strategies. But it's far from ideal. Tape backup is slow. Finding the right files to restore is even slower. Frequently, files can't be recovered at all.

"Tape is increasingly being exposed as a substandard medium for backups," says Simon Robinson, a storage analyst at The 451 Group, a San Francisco-based consultancy. "Users like it because it's cheap, but it's inherently unreliable and performs poorly. Tape still has its place as a longer-term archive but is being superseded by disk."

According to The 451 Group, tape storage costs about 12 cents per gigabyte compared with 50 cents for secondary disk storage and $2.50 for primary disks. That makes disk economically viable for routine backups, leaving tape for off-site archiving.

"Many IT organizations use disk as the backup target to shrink their backup window or improve access times for restore," says Lauren Whitehouse, an analyst at Enterprise Strategy Group Inc. in Milford, Mass. "Some organizations leverage virtual tape library solutions, which emulate tape devices to the backup application, and others are implementing the disk backup options of their backup solution."

Conventional disk-backup technologies include RAID configurations, traditional backup applications, replication, mirroring and taking snapshots every few hours. Disk-based snapshots provide more current data for restoration than nightly backups and are easier to restore than tape.

"We recommend using disk-to-disk backup using block-level snap vaulting for operational backup," says Joe Shields, director of systems engineering and operations at LightEdge Solutions Inc., a managed network, voice services and hosting company in Des Moines. "This provides the short recovery time objective and frequent recovery point objectives and is cost-effective."

Disks, though, are also being used as an intermediary step in tape backups (disk-to-disk-to-tape backups). Preston says the problem with tape is often a mismatch between network and tape speed.

"You are not always able to supply the tape drive with enough data, so it stops and starts when trying to keep up with the slow incoming data rate," says Preston. "This can even cause the backup to fail."

Writing to disk first and then to tape allows a better match-up in data rates. Toronto's York University, for example, uses disks to speed database backups.

"We will be able to do backups much faster from the server standpoint and then cycle it to tape during the day," says Ramon Kagan, the university's manager of Unix services. "This will save a lot of time."

Dedupe Your Data

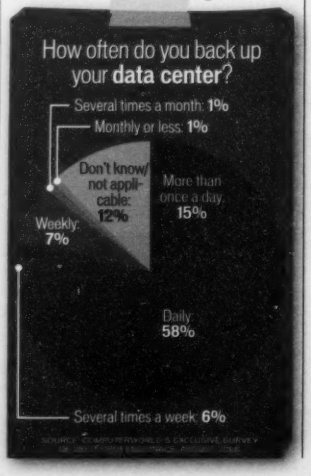
Over time, tape will fade in the enterprise, except in long-term storage. The 451 Group says start-ups have invested $500 million in seed money in virtual tape libraries (VTL), data deduplication and continuous data protection (CDP).

"VTL solutions offer IT organizations a more efficient way to integrate disk-

Continued on page 34

10 Tips for Backing Up Your Data Center

1. **Save to disk** before going to tape.
2. **Figure out the restore,** then plan the backup to match.
3. **Deduplicate the data** to speed backup time and reduce the amount of storage needed.
4. **Look for network bottlenecks** that slow down backup and restore.
5. **Don't rely on a single technology.** Use multiple layers of protection.
6. **Minimize the number of backup products** you use.
7. **Set up restoration as a help desk function** so storage professionals can work on improving levels of service.
8. **Have backups stored outside the disaster impact zone.**
9. **Test the restoration process before it is needed,** and tier your backups depending on how quickly they need restoration.
10. **Make sure the recovery plan is stored with the backup data.**


How often do you back up your data center?
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Monthly or less: 1%
Don't know/ not applicable: 12%
More than once a day: 15%
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Daily: 58%
Several times a week: 6%

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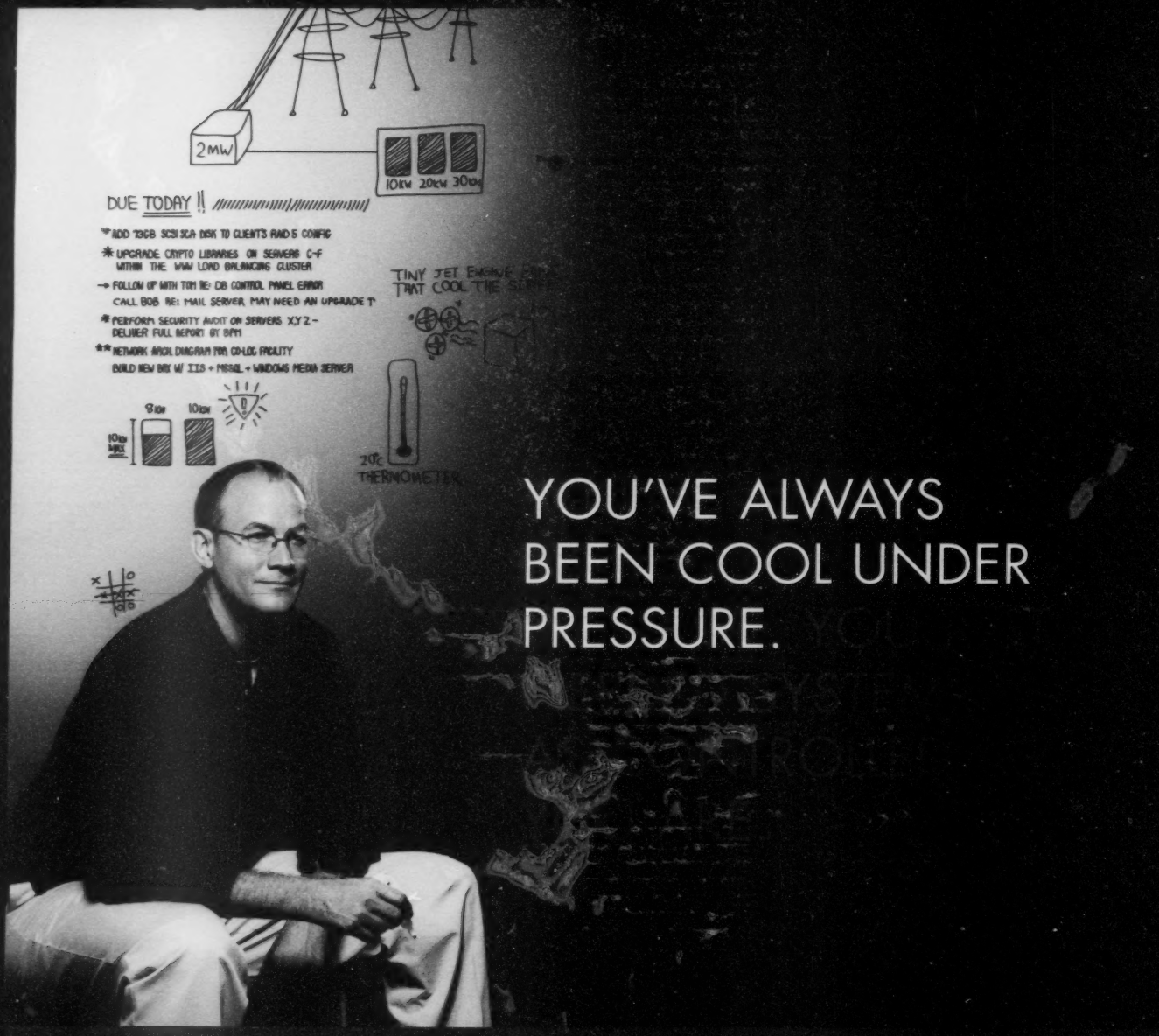
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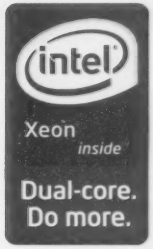

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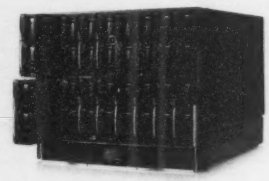

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Backups Gone Badly

LATE ONE FRIDAY NIGHT, while working with the database administrators to perform an upgrade and backup, a typical Colorado Springs storm blew in. The data center walls trembled, then came a huge bang, the lights flickered, and a message on the Univac read, "Site Terminated." The standby generator and storage batteries were housed in a small building near the main computer center, so we went to investigate. A lightning bolt had ripped a 2-inch hole through one of the storage batteries. Our backup policy never anticipated that!

– B.J., SAN JOSE

WHEN THE REGULAR IT TECHNICIAN WAS OUT SICK, his supervisor decided to "clean up" some drives – deleting our database of reports. It took our regular technician three hours to restore them from the backup. We had a NAT [network address translation] fail, but the backup NAT was OK, so the technician changed the name of the backup to be the same as the main NAT. That worked fine until the primary NAT was back online. During the nightly backup, the primary NAT, which was unused for 48 hours, backed up to the backup NAT – erasing all files for the two days it was down. That technician was fired.

– T.G., BALTIMORE

WHILE I WAS ON VACATION, a young IT staffer, new to the company, decided to run his own "updated" version of an Oracle backup – wiping out the live database. I had to fly back from Scotland to rebuild the database and restore from backup. Thankfully, only a half-day's work had to be input – by 30 people!

– L.B., CORAL SPRINGS, FLA.

WE LOST TWO YEARS' WORTH OF DATA at one site because of a former technician's mistake. The technician set up home folders for users for backup, mapped them to a file server, then removed the file server from the domain. Problem was, he didn't tell anyone that he removed that file server, and the log-on script he created for the users hid the error.

– C.H., PORTOLA, CALIF.

HERE'S SOME ADVICE about Linux Red Hat and Windows 2003 Server. When installing mixed operating systems, buy the required backup software licensing before you start! After our Linux server installation, our CEO didn't want to spend money to upgrade the backup software. So I resorted to incrementally and fully backing up to my workstation via a batch file. I quickly ran out of space and removed the oldest backup files. Two days later, those "old" files are just what our engineering department needed. What a loss. That same day, accounting agreed to purchase the additional license.

– C.L., NORTH TONAWANDA, N.Y.

Continued from page 30

to-disk backup," says Whitehouse.

Data deduplication eliminates the need to store and back up numerous copies of documents or the 10,000 copies of an e-mail the CEO sent to all employees. "We have commonly seen 20-to-1 capacity reduction using data deduplication," says Whitehouse.

CDP, on the other hand, consists of any of a set of technologies that back up data as soon as it is written to the primary drive. The copy can be stored locally or at a disaster recovery facility. CDP can be harnessed to achieve the highest levels of RPO.

"The ideal solution is to use CDP to mirror data to a remote recovery site, combined with full backups on a regular basis to a different off-site location," says Weinhoeft. "However, this is also the most expensive solution."

While each of these technologies is available as a point product, look for them to be merged as vendors seek to create more complete backup offerings. "VTL vendors are adding deduplication, and vice versa, while there's also consolidation taking place in the snapshot/replication/CDP market," says Robinson.

Search Out Bottlenecks

Whatever technology is deployed, experts emphasize that organizations must never lose sight of the overall purpose of backup — achieving continuous data and service availability. This necessitates an all-encompassing view. It isn't just a matter of the source and target devices, but of the network as well.

For example, the use of server virtualization lets hardware run much nearer capacity during normal operations. Since backup is a resource-intensive operation, multiple virtual servers on the same box trying to use the same backup window can overwhelm the network interface card.

Similarly, if live updates are made to a remote facility, you might want to use deduplication and a WAN acceleration appliance so the traffic can make it through the pipe. Also, there must be adequate bandwidth at a fail-over facility to accommodate not only the backups but also business traffic when the facility becomes the primary data center. This should be calculated and tested thoroughly.

"Make sure that you walk through the whole chain, from client to network to server to tape drive, to identify bottlenecks," says Preston. "You may be surprised to find that the bottleneck is Gigabit Ethernet to the tape drive."

Another factor is vendor mix. Even when using different technologies for different types of storage, try to reduce the number of products supported.

"If you can get the job done with one, it is better than getting the best of breed for Linux, Windows, etc., and winding up with three backup products," says Preston.

These broad guidelines can help when developing a backup strategy for the data center. However, there is no cookie-cutter approach that will fit every company's needs. And there is no substitute for communication with all involved to formulate a backup strategy that aligns closely with business needs, budgets and priorities.

"The data center manager needs to speak with stakeholders to gain a good understanding of the value of each set of data," says Mike Karp, an analyst at Enterprise Management Associates in Boulder, Colo. "Once you understand the value, you can figure out the hardware and levels of service, how frequently to back up and the type of backup."

Robb is a Computerworld *contributing writer.*

AVAILABILITY ACRONYMS

CDP. Continuous data protection. Methods that involve backing up whenever data is changed, rather than at fixed points in time. CDP systems are primarily used for important databases.

D2D. Disk to disk. Backing up data onto another hard drive.

D2D2T. Disk-to-disk-to-tape. Using disk backup as an intermediate step before sending the data to a tape for backup.

NGDP. Next-generation data protection. Technologies such as continuous data protection, data reduction and virtual tape libraries.

RPO. Recovery point objective. Your assessment of how current the data being restored must be; used in determining frequency of backup.

RTO. Recovery time objective. The maximum amount of time a system or application can be down following a failure.

VTL. Virtual tape library. A disk storage device that looks like a tape drive to backup software. It gives organizations the opportunity to implement disk-based backup/recovery without having to replace the software.

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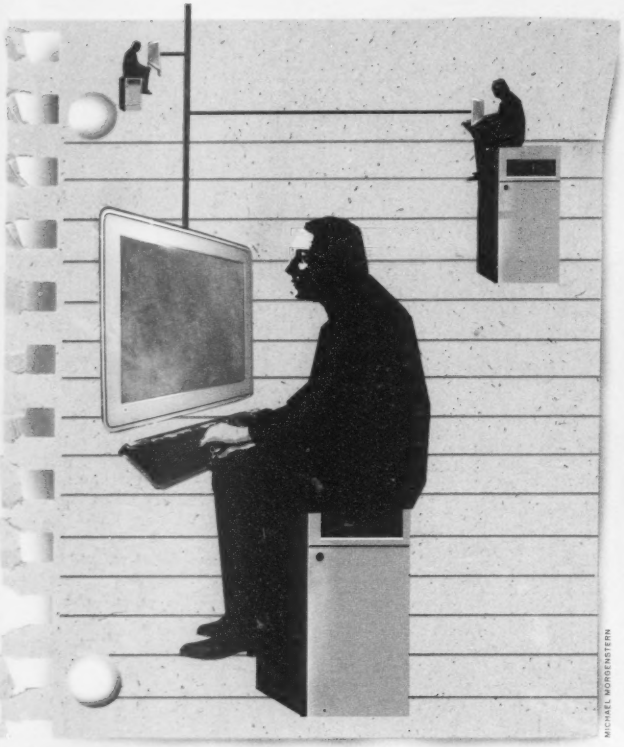

MICHAEL MONDENSTERN

Branch Offices

Develop a plan that includes remote data storage. And make someone at the branch responsible for getting it done.

By Russell Kay

BACKUP SEEMS like it should be a fairly simple, straightforward process. In case something bad happens to your data, you want to have an extra copy on hand that you can use to resume your normal business. But what about backing up a bunch of branch offices?

What's simple in concept turns out to be very complex in practice. Among other problems, backing up data is a little like a dogfight between combat planes: You're shooting at a moving target, and all the while, you're moving, too. Every aspect of backup — from policies to technologies to schedules to the criteria for what data to protect — can change daily. So before getting into specific technical and procedural recommendations, let's step back and consider a few basic issues. First, there are some questions you need to answer.

What data — and how much — do you need to back up? Storage is dirt-cheap these days, and it keeps getting both physically smaller and less expensive for each new byte you keep. So it's easy to think that the simplest solution is to back up everything. But remember the old joke from the discount salesman: "I lose money on every single item I sell, but I make my profit on the volume."

No matter how low the unit price, the total real cost of backup, in both time and money, keeps rising every day as our organizations amass more and more data. If a branch is saving data that is ephemeral and there's no compelling reason to keep it, then you're

Continued on page 38

ROTATE YOUR BACKUP MEDIA

Magnetic backup media such as disks and tapes can typically be reused and recycled numerous times, and most rotating backup schemes take full advantage of this. Here's a typical approach:

Make a complete backup every week, with incremental backups on successive days. Keep the past four weeks' worth of backups, then recycle the oldest of the daily media into the next rotation.

Every month, pull the first (or the last) full backup, label it as the monthly backup, and send it off to secure storage.

Repeat the previous step every quarter, if appropriate, and then every year.

Keep the annual backups forever.

Review your branch's own rotation cycles to make sure you're actually keeping older backups. Sometimes that part of the cycle gets overlooked.

– RUSSELL KAY

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Continued from page 36

expending valuable resources to little purpose. So you have to balance the wisdom of saving everything against the cost. Work with your systems, line-of-business and legal departments to determine how long data should be retained. Some backup data may be needed for only a few months; in other cases, the data may need to be kept for years or decades.

The list of questions to answer goes on. Can you actually use or restore any of your backups? When you back up your data, how do you store the copy? Do you use tape, secondary magnetic disk, removable optical disc or online storage? This is especially important for data that must be archived but might not be accessed for a long time. When you pull a tape cartridge out of storage, can you still read it, or has the oxide coating collapsed into rust dust?

Assuming the tape is OK, do you still have hardware that reads that tape format? And if the tape and the machines work fine, do you still have functioning software that can use the data in the format in which it's stored? Here are some steps you can take to ensure efficient remote storage backups:

Make Your Backups Productive

■ **Keep to a dedicated, noninterruptive backup schedule designed around the branch's business needs.** Perhaps the most important aspect of backup is that you do it at all. But it's often considered a resource hog, so it's important to make the process as efficient as possible. Work with branch employees to schedule backups for times when they will cause the least disruption to operations.

You're almost certainly backing up your data at least once a day. But some data sets are so important that you can't afford for them to be unavailable for more than a very short period. In these cases, you need a way to take a quick snapshot of the data at a given point in time and to do it in a way that doesn't bring the system down or make the data unavailable. Some form of disk-to-disk or network backup is going to be mandatory for this purpose.

Any kind of backup gives you some protection against device failures, system crashes or user error. But you also need to protect against disasters — hurricanes, floods, fires or criminal or terrorist acts, for example — by getting those backups to a safe place that is far from your branch office. How far? Financial regulators suggest that banks maintain backup IT sites and remote data centers that are at least 100 miles away from the company's central IT facility. The important thing to remember is that you want to get the backup data — and any equipment that will use it during an emergency — away from the potential path of a disaster.

■ **Make sure someone is in charge at the branch.** Backup is easy to put off unless someone is accountable for getting it done every day. Give someone the responsibility, and name a stand-in for those times when the primary person is unavailable.

■ **Test. Test again.** If you've backed up your data but haven't tried to restore it, then you're whistling in the dark. It's far better to discover any problems and fix them during regularly scheduled monthly or quarterly testing sessions than when you suddenly need a backup.

■ **Check your backup logs.** Most organizations' backup processes rely on periodic (often weekly) full backups supplemented by more frequent (daily or more) incremental or differential backups. These smaller data sets can be backed up faster, but they take longer to restore, and you need to have all the tapes between the last full backup and the current date. Any errors or missing or corrupted data could cause a restore operation to fail. A backup job may at first glance seem like it completed successfully, but it may have missed some files entirely or produced incorrect checksums. The only way to catch these is to review the log files generated for each backup job and check for errors, job duration and similar indicators. Logs may give you the first signals that backups aren't finishing or that the media is going bad.

■ **Manage your backup media.** Backup media won't last forever. At some point, it may stop recording reliably, or coatings may degrade and flake off. Broken or stretched tape is less common than it once was, but if a tape does stretch or break, it becomes a throwaway and you lose some backup data.

The environment in which media is stored is critical. This could well be a bigger problem at branch offices than it is at centralized data centers.

To guard against the effects of wear and tear, you need to track the use of each backup unit (for example, a tape reel or cartridge) to understand when you can reuse it and when it should be retired and disposed of. Determining what that end-of-life point is, unfortunately, isn't as simple and straightforward as anyone would like. Different vendors offer quite different recommendations as to the life of their otherwise compatible media.

And when it is time to retire media, don't just throw it into the trash. Physically destroy it so that there's no chance of a third party reading your data.

■ **Secure your backups in transit and in storage.** Make sure your backups are protected from unauthorized access. This is especially true when you let backup media out from under your direct control, like when you send it to a remote facility for storage or when an employee takes the daily tapes home. And whether your backups get to the remote site as physical media transported by truck or in electronic form sent over a network, they may be vulnerable to theft, accidental damage or inadvertent corruption.

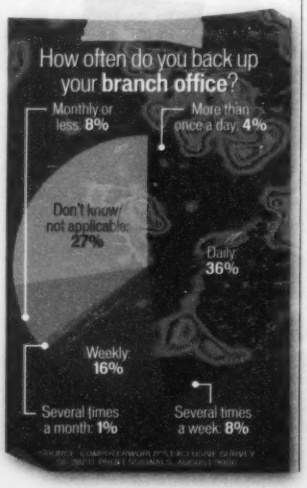
■ **Encrypt your backups.** To further secure your data, consider encrypting it during the backup process. But make sure your processes are tested and as foolproof as you can make them. And don't forget to plan for what happens if your encryption vendor goes out of business or a set of encryption keys is compromised.

■ **Stay on the alert for new technologies.** Given the rate at which storage densities increase and the ever-increasing amount of corporate data, no backup system will last very long before it's overwhelmed by the sheer volume of data and the shrinking time available in which to perform backups. Keep abreast of new options, new tape and optical formats, and the cost of mirrored or otherwise protected disk storage. The technologies will change, and it's likely that your needs and those of your branch offices will too.

Kay is a Computerworld *contributing writer in Worcester, Mass. You can contact him at russkay@charter.net.*

10 Tips for Backing Up Your Branch Office

1. **For small amounts of data, consider online, network-based backup** as a viable alternative to dedicated backup systems and media.
2. **Automate backup as much as possible.**
3. **If using dedicated hardware, arrange to send the backup media off-site every day.**
4. **Make sure more than one person knows how to run the backup process.**
5. **Periodically check the branch office backups** to make sure they are usable and that branch personnel know how to restore data.
6. **Don't try to skimp by buying off-brand media.** You'll pay a premium for the good stuff, but this is your business being backed up.
7. **Track the use of backup media and replace it regularly** – before you lose important data.
8. **Periodically check with the branch employees who actually run the backups** to see if they have questions or have experienced problems that have gone unreported.
9. **As time passes, make sure that the branch's backup technology keeps pace with its data volume and workload.** Small-capacity backup units often take a disproportionately long time to operate.
10. **If your branch backup runs overnight, make sure that any reports are checked first thing the next morning;** don't just put the tape or disk away and assume that it's OK.


How often do you back up your branch office?
Monthly or less: 8%
More than once a day: 4%
Don't know/ not applicable: 27%
Daily: 36%
Weekly: 16%
Several times a month: 1%
Several times a week: 8%

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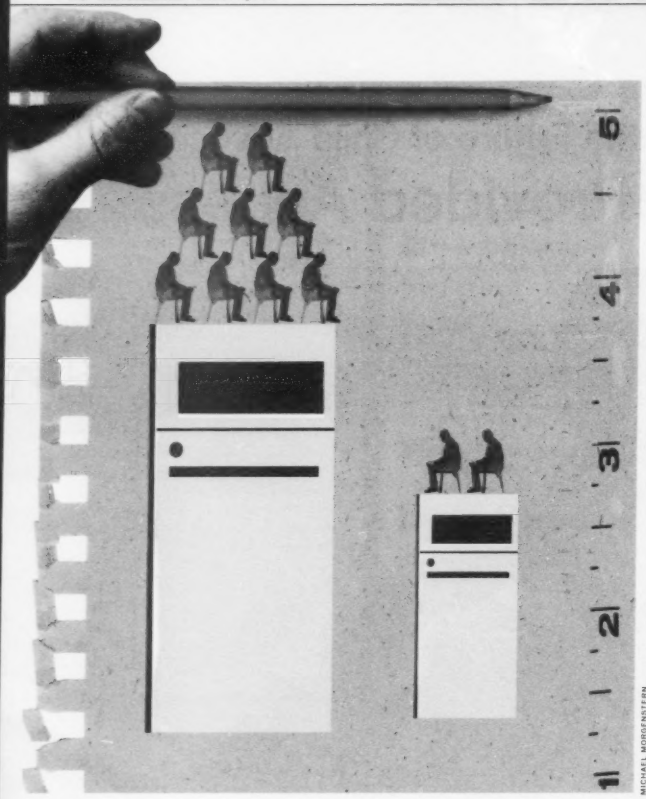

MICHAEL MORGENSTERN

Getting users to care about backing up their data is the first step. Next, find the approach that best fits your company size.

By Jon L. Jacobi

Desktops

SAFEGUARDING network-centralized data is the traditional purpose of corporate backups, but even in the most rigidly controlled environments, data can seep out onto local desktops and laptops. Smaller companies may even keep all of their vital data on local peer-to-peer machines.

Whatever the size of your organization, desktops and laptops deserve respect when it comes to backups — you never know where the next billion-dollar idea may reside. And even time spent re-creating lists of bookmarks, address books or the look and feel of a PC after a crash is time users could have devoted to their work.

Backing up your desktops and laptops is becoming less painful as software vendors continue to simplify the task. There's no one-size-fits-all solution, but here are some best practices and the latest techniques.

What You Back Up

In formulating a desktop backup strategy, the first step is deciding what to back up. The most convenient approach in terms of planning and restoring is to simply back up everything. However, vital data generally represents a very small subset of the information on any given machine. The difficulty is identifying this critical information.

One solution is consolidation. It's a relatively simple task to force data into one folder, especially if you're standardized on one set of applications. Nearly all applications and operating systems allow you to specify the storage locations for files, document folders, e-mail, commonly used applets like address books and so on.

With a little forethought, you can roll out a new installation that puts all vital data and user preferences in a central location. If you don't control installations or aren't consolidated on a particular application set, let your users know how to relocate their important data to a single, possibly shared, folder, thereby enabling security.

The answer to the question of how often you should back up your desktops is, of course, as often as possible. But many companies don't have enough storage capacity, bandwidth, time or CPU cycles to maintain anything resembling a fully synchronized real-time backup image. It's all about balance.

Industry experts such as Michael Parker, senior product manager at Symantec Corp., and Stephen Lawton, senior director of strategic marketing at Acronis Inc., recommend, at a minimum, weekly full backups (backing up the entire machine) and nightly incremental/differential backups (saving only data that has changed since the previous backup or backing up all data changed since the last full backup).

Backup schedules are highly dependent on the rate at which your data sets evolve, and there are numerous schemes, such as grandfather/father/son and the "Tower of Hanoi," to choose from. Best practices for frequently updated data sets might include continuous data protection (CDP), which is emerging in many products. Users are also a good barometer of backup frequency. Ask them how long it would take to re-create what they were doing, and measure that against the time they would lose backing up.

Across the Network

If you have a reasonable amount of space in your centralized storage, that's most likely the best repository for your desktop or laptop backups. Putting the data there lets you leverage the backup resources you already have in place.

Products such as Symantec's NetBackup, EMC Corp.'s Retrospect Server and IBM's Tivoli Storage Manager all facilitate centralized management and provide local clients for virtually any operating system. A far cheaper, albeit less elegant, solution for smaller businesses is to provide network shares and use readily available desktop backup programs. There are competent backup applications for every operating system, and many of them are free.

Local Network Storage

Network-attached storage (NAS) more properly falls under the heading of backing up across the network, but it deserves a separate mention simply because it's a superior method for smaller shops and workgroups. But there's a false impression that it's expensive. Easily configurable single-drive NAS boxes from Maxtor Corp., Western Digital Corp. and others are priced well under $1 per gigabyte. Most also allow expan-

Continued on page 42

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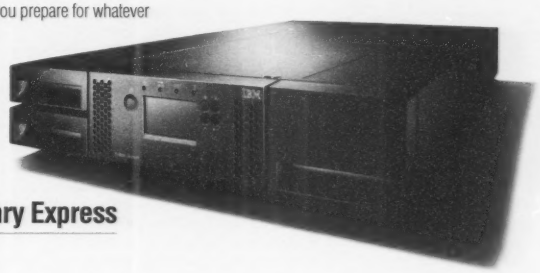

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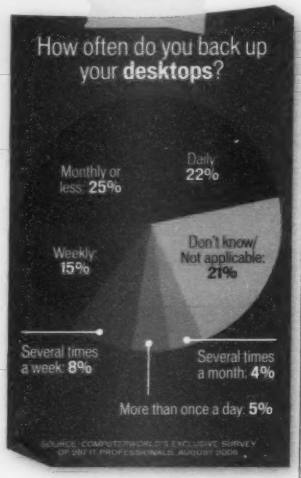
How often do you back up your desktops?
Daily: 22%
Monthly or less: 25%
Weekly: 15%
Don't know/ Not applicable: 21%
Several times a week: 8%
Several times a month: 4%
More than once a day: 5%
SOURCE: COMPUTERWORLD'S EXCLUSIVE SURVEY OF 380 IT PROFESSIONALS, AUGUST 2006

Continued from page 40

sion via USB direct-attached drives for an even lower cost per gigabyte. A $300 drive that's physically isolated and used with some scheduled backups is a pretty cheap way to ward off time-wasting re-creation procedures.

Back Up Online

If you're supporting a large operation with a WAN and off-site repositories, chances are you also have a virtual private network (VPN) and automated clients. Those are useful resources. Gerry Maddalozzo, a networking consultant in San Francisco, recalls his days at PricewaterhouseCoopers: "Whether I was in São Paolo or Singapore, logging in via a VPN to automatically offload vital data from my laptop to a safe location was both convenient and reassuring." For large-scale backup, this is the best way to go.

For smaller companies, an online backup service can provide both off-site safety, worldwide access and redundancy. Kevin Railsbeck, director of IT at *InfoWorld* magazine, a sister publication of *Computerworld*, chose Iron Mountain Inc.'s Connected Data Protector for his backup needs. "Online backup, specifically Connected, was the only option that allowed us to provide the same reliability and quality of backups for all of our users, both in-the-office and remote workers," he says. "Also, they were the only provider of full-system backup over the network when we chose them in early 2002."

There are many other business-oriented online choices, including Backup.com's @Backup, Acpana Business Systems Inc.'s Data Deposit Box, AmberWave Communications' First-Backup, Intronis LLC's ESureIT, Iomega Corp.'s IStorage Online and NovaStor Corp.'s Online Backup Service, as well as products from AmeriVault Corp., DataVault Inc., Register.com and SwapDrive Inc.

Local Storage Do's and Don'ts

A strategy that provides shared local hardware but leaves users on their own is hardly optimal. But it can be modestly effective if you educate users about the need for backing up. Users are more comfortable backing up with hard drives than tape or optical media for a number of reasons: fear of disk swaps and tape rewind, bad memories of melted cassette tapes and so on.

As a matter of fact, users tend to be too comfortable with external hard drives, not realizing that the backup drive is just as likely to fail as the drive it's backing up. If you're providing external hard drives, require or encourage rotation. A secondary internal hard drive, while subject to the same box-scale physical dangers as the primary drive, is a hedge against drive failure and malware attacks and avoids the threat of ham-handed employees.

Despite the affinity many users feel for hard drives, a baseline backup to removable, storable CD or DVD is the appropriate first step for local backup. Hint: It's an easier sell if you tell users they need to do it only once. Just make sure they don't skip verification. The best practice is to provide a safe location for storing these backups, and they ideally should be cataloged by IT.

If you decide on or are forced into a backup strategy that leaves users on their own, don't fail to educate them on backup do's and don'ts. Some users think they're safe backing up data to a different folder on the same partition. Even experienced users may fail to recognize the need for redundancy, rotating backups, password protection/encryption and simply backing up often enough. Better than education is education and assisted implementation — install or configure a local backup program for them that will run hands-off in the background. Spending 10 to 20 minutes now can save your department hours in the long run.

Continuous Backup

If the data on a workstation or laptop is revision-intensive or constantly evolving, continuous backup is well worth considering. CDP is a hot feature these days and can be found in products such as Atempo Inc.'s LiveBackup/LiveServ and Tivoli Storage Manager and NetBackup. CDP on the desktop has become almost a boom market since vendors discovered Windows Volume Shadow Copy Service. NewTech Infosystems Inc.'s Shadow and Stardock Corp.'s KeepSafe, which back up designated files as they are saved or at frequent intervals, are just two examples. IBM has even broken out the CDP from Tivoli in order to market it to end users. Most CDP applications can store multiple revisions and, with the autosave feature, create an ad hoc document archiving system.

Traditional Backup vs. Imaging

Traditional backup for the desktop, or backing up at the file level, still has many adherents, largely because the major players — Symantec's Backup Exec, EMC's Retrospect and NovaStor's NovaBackup — all offer support for the latest and greatest tape as well as hard drives and optical media. For backing up, you can't beat them, but disaster recovery is more complex and time-consuming than with imaging, though Windows Volume Shadow Copy Service has helped with the problem of backing up open files — a former bugaboo of the traditional approach to backup under Windows.

Imaging entire partitions sector by sector is thought of as something you do at the time of deployment, but the simplicity of restoring images continues to win fans. The latest products, such as Symantec's Ghost 10 and Acronis Inc.'s True Image 9.1, address the old complaints about heavy space requirements and unwieldiness by providing both incremental backups and backups of individual files and folders.

With huge amounts of data now living on desktops and laptops, you need a proactive attitude. Back them up; you'll be glad you did.

Jacobi is a freelance writer in San Francisco. You can contact him at jon@jonljacobi.com.

BACK UP WITHOUT AN ONLINE CONNECTION

If your mobile users aren't able to connect regularly or long enough to back up via your network, your intranet or an online service, there are a number of ways to provide at least minimal local protection.

Backing up to a USB flash drive, optical media or external hard drive is better than nothing, although vulnerability to theft and accidental loss are significant negatives.

These are also negatives for flash memory cards and PC card hard drives, although the fact that they are within the body of the laptops makes them less vulnerable.

A secondary internal hard drive may be employed on larger notebooks with modular bays, although it will be as susceptible to shock damage as the primary drive.

– JON L. JACOBI

10 Tips for Backing Up Your Desktops

1. **Automate the desktop backup process** whenever possible. Best intentions are exactly that.
2. **Have users organize and consolidate important data** in a single location for easier backup.
3. **Use continuous data protection** when data sets are evolving at a high rate.
4. **Use an online service or VPN,** plus a connection-sensing local client, for remote users.
5. **Put desktop and laptop backups in your central data store** to leverage its backup and redundancy.
6. **Use imaging** for quick and easy restoration of systems.
7. **Image to hidden partitions** on laptops for system recovery without IT assistance.
8. **Use plain (uncompressed) file backups** so users can browse and restore single documents on their own.
9. **Save multiple revisions** with your CDP system to create an ad hoc document archiving system.
10. **Educate and continually re-educate users** on the importance of backing up their desktops.

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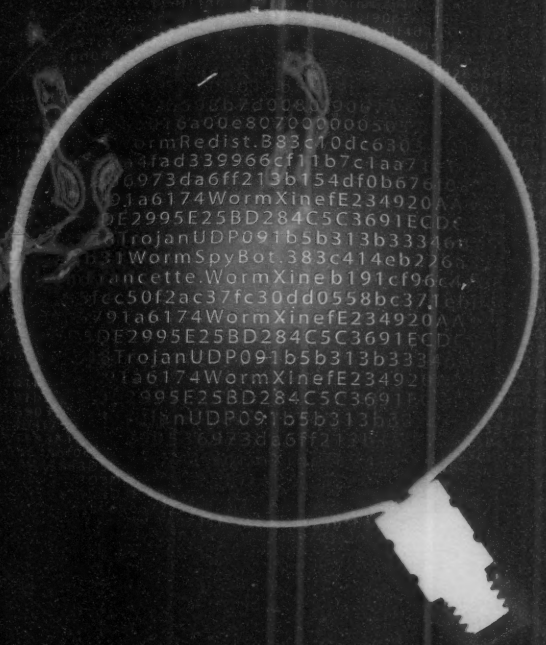

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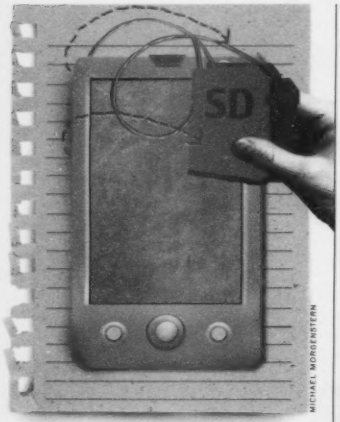
PDAs

Treat these wireless handhelds as networked devices, and equip users with backup software and memory cards.

By G. Berton Latamore



MICHAEL MORGENSTERN

MOBILE and wireless devices such as BlackBerries, smart phones and high-end PDAs are becoming standard parts of the knowledge worker's tool kit. According to J. Gold Associates, within two to three years, smart phone devices will be used by 75% to 85% of knowledge workers. These devices offer increased convenience and connectivity, both inside and outside the office, making employees more available and more productive.

But with benefits come risks. Handhelds and smart phones can easily be left behind in a restaurant, cab or airplane. They can be dropped and broken or just fail with no warning. Also, unlike PCs, most handhelds don't have the equivalent of a hard drive. Almost all of their data and software resides in volatile memory that provides some data protection. However, newer devices are moving to nonvolatile flash memory, even allowing outboard storage on Secure Digital (SD) cards.

Frequent backup in addition to normal synchronization is the best defense against data loss.

"The last thing a company wants is for a field worker to lose a day or more of work that will have to be re-created at a major cost," says Jack Gold, president of J. Gold Associates in Northboro, Mass.

Keep Them Clean

Proper handheld data management starts by avoiding the tendency to keep single copies of important data on a handheld. To the extent possible, PDAs should be treated as networked devices, running the front ends of server-based software and storing the data they use on the network server. Most modern enterprise applications from vendors such as SAP AG and Siebel Systems Inc. provide handheld clients that operate on this principle.

If the devices are used in the field, they will inevitably be out of network range from time to time and will have to run on the slower cellular network. So the basic analytical functionality, and in some cases a copy of the data the user needs immediately, has to reside on the handheld. But the user should back up all changes as soon as possible in the background, and the master database should be on a server, not the handheld.

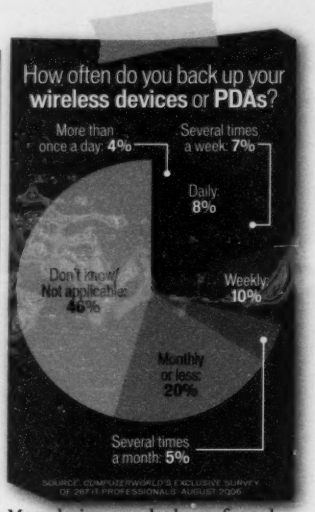
Keep Them Backed Up

The second line of defense against data loss is data backup. High-end handhelds and smart phones come with software that allows users to back up their data to a laptop or desktop. Encourage your users to make that a daily practice. In addition, all these devices use SD cards for storage.

Third-party software is also available for backups — including automatic prescheduled backups — of the contents of memory to the card. Every device should be backed up to at least one SD card at least once a day. A copy of the backup software should be installed on every backup card. That will allow a user to restore in minutes all contents of the device's memory as of the last backup after a hard crash.

The best practice is to do daily backups to two memory cards, one of which resides in the device during normal operation and can also hold applications and data. The other should be kept separate, in case the device is lost or stolen. Then the user should do a new backup anytime important data is added or changed on the device.

In reality, of course, many users will never learn to do regular backups. Therefore, it's important to preset the software to do automatic backups to the SD card, in the middle of each night, before issuing the device.


How often do you back up your wireless devices or PDAs?
More than once a day: 4%
Several times a week: 7%
Daily: 8%
Weekly: 10%
Monthly or less: 20%
Several times a month: 5%
Don't know/ Not applicable: 46%
SOURCE: COMPUTERWORLD'S EXCLUSIVE SURVEY OF 267 IT PROFESSIONALS, AUGUST 2006

Many devices can also be configured to automatically run synchronizations through a Wi-Fi or cellular network to a corporate server, providing an extra level of security for data that must reside in volatile RAM on the device.

Overall, mobile devices have their own unique data backup situation. However, with proper precautions — and most important, educational efforts — the data on these devices can be as secure as any other information stored in your system.

Latamore is a freelance writer specializing in handheld devices. He writes a weekly blog on Computerworld.com *called "The PDA Guerilla." Contact him at bertlatamore@yahoo.com.*

5 Tips for Backing Up Your PDAs

1. **Keep master copies of all corporate data on the server.** Many applications have extensions to provide data to PDAs and smart phones.
2. **Make new backups of the contents of memory whenever you make a significant addition or change to your data,** either to an SD memory card, local computer or over the network to a corporate server.
3. **Back up to two local memory cards,** one of which is kept separate from the device in case of loss or theft, and to at least your local laptop or desktop computer daily.
4. **Make frequent copies of SD card contents.** Some PDA and smart phone applications read data directly from an SD card, essentially using it as a solid-state hard drive.
5. **Automate backups so they won't be forgotten.** Most PDA and smart phone backup software today allows you to schedule daily automatic backups both to an SD card and over a Wi-Fi or cellular network to a corporate server.

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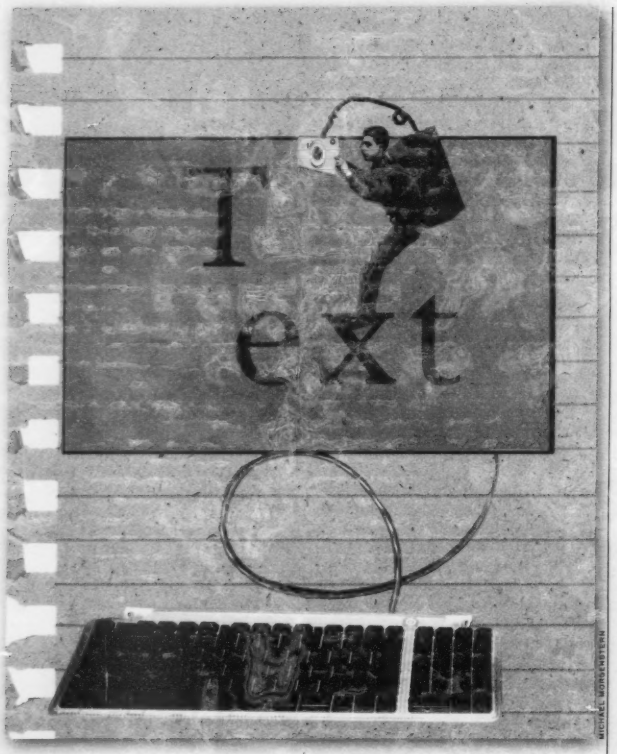

Timing is everything. Keep critical e-mail systems up and running while taking frequent snapshots of messaging data.

By Michele Hope

ASK ANY Microsoft Exchange administrator to describe his worst nightmare, and you'll likely get the same answer: having to take down the system unexpectedly, then getting peppered with questions from the company president on down about when it's coming back online. Clearly, you don't want your answer to be, "It might not happen for several hours," or, "Maybe tomorrow."

Despite wanting to avoid this scenario, many messaging administrators still find themselves struggling to meet the increasing backup and restore times their message stores now require. In a survey conducted by Osterman Research Inc. for its report "Enterprise Messaging Market Trends, 2005-2008," respondents rated increased backup and restore times as their No. 1 message system problem. And among the top five were three challenges that tend to exacerbate the backup problem: the increasing size of messages, an increase in attachments and the related overall growth of messaging-related storage.

"Message stores are growing at a little over 40% per year," says Michael Osterman, president of Black Diamond, Wash.-based Osterman Research. "As these stores grow larger, the window for backup is definitely getting smaller."

Get Beyond the Basics

Osterman notes that the majority of companies still perform what he calls "standard backup," where they back up messaging servers to tape following a daily (or incremental) and weekly (or full) schedule.

While this backup practice is a relatively low-cost way to protect messaging systems, it presents a few stumbling blocks for messaging administration. For one thing, it's tough to find a chunk of time in the average day to bring down a company's critical e-mail system in order to run — and complete — the associated backup jobs.

Second, restores from tape will work, but it can take a long time to recover e-mail that way. They might also include sizable gaps because of the amount of e-mail missed since the last backup. Finally, tape backups don't always offer an easy way to perform the more granular restores a user might require, such as restoration of a critical e-mail, subfolder or specific user mailbox.

Increasingly, administrators have begun to focus instead on changing their mail systems' underlying storage platform from server-based, direct-attached storage (DAS) to some type of storage-area network (SAN) that offers more options for faster, disk-based e-mail backups and restores.

Some e-mail administrators have come to favor SANs based on the Internet SCSI protocol because they often cost less than their Fibre Channel SAN counterparts and iSCSI is based on the more familiar TCP/IP.

Jay Brummett, chief technology officer for the city of Ogden City, Utah, made the switch to an iSCSI SAN from LeftHand Networks Inc. after he witnessed the 36-hour, bare-metal restore from tape that was required during an Exchange system failure.

The LeftHand SAN uses snapshot technology that allows the IT group to save quick copies of the Exchange database to disk at three prescheduled times each day. More important, other than a few seconds to quiesce, or freeze, the Exchange database to ensure that all transactions maintain database integrity within the snapshot, Exchange doesn't have to be taken out of production while the snapshots are made.

Look to New Technologies

Experts say many organizations are moving away from DAS to networked storage that offers snapshot technology closely integrated with Microsoft Exchange and Microsoft Corp.'s Volume Shadow Copy Service. Integration with Exchange and the ability to take snapshots without affecting Exchange database integrity are crucial to backup success, says W. Curtis Preston, vice president of data protection services at GlassHouse Technologies Inc. and author of multiple books on backups and storage, including *Backup & Recovery*

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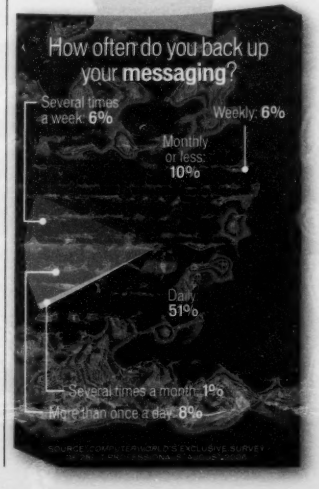
How often do you back up your messaging?
Several times a week: 6%
Weekly: 6%
Monthly or less: 10%
Daily: 51%
Several times a month: 19%
More than once a day: 8%

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10 Tips for Backing Up Your Messaging

1. **Decide between backup and archiving:** Do you need to restore messages from a failure event (backup) or store/retrieve data to comply with legislation or a legal request for discovery?
2. **Know what you are trying to gain** with the backup and what level of restore granularity you require.
3. **Fully disclose instant messaging monitoring or recording to IM users** as part of your company's written policy.
4. **Focus on reducing the size** of the message store by removing duplicate e-mail and attachments.
5. **Apply ongoing, disk-based technology,** such as snapshots, to capture changes to the now-more-manageable message store.
6. **Consider contracting with a messaging-specific archival or disaster recovery-related service provider** if you haven't the time or resources to build out an internal IT infrastructure.
7. **Determine, with the help of legal and compliance counsel, whether e-mail-related backups should be kept indefinitely** on disk or tape or deleted after a certain period of time.
8. **Know how long you are legally required to retain** specific messaging backup data or message archives, and plan for such deadlines.
9. **Develop, write and disseminate policies** for the handling, protection and archiving of messaging systems.
10. **At the least, perform a daily dump of the messaging system** to disk via the Microsoft Windows NTbackup command.

Continued from page 46

(O'Reilly Media), due out in December.

Both Preston and Osterman cite Exchange-targeted technology offered by Network Appliance Inc. as one example of the integrated snapshots they now see in use. Beyond its basic Snapshot technology, NetApp offers an Exchange-related software suite with two products aimed at recovery of Exchange environments: SnapManager for Exchange and Single Mailbox Recovery for Exchange.

Preston is quick to point out that snapshot technology, while a good option, is just one of many disk-based backup technologies now available. Messaging environments also can retain a more traditional incremental/full backup routine for Exchange but use a virtual tape library first for faster backups, and then more quickly stream that data set from disk to tape.

Other messaging-related data protection vendors, such as Mimosa Systems Inc. in Santa Clara, Calif., offer something similar to continuous data protection (CDP) functionality by keeping a running log of mail activity as part of their automated data protection schemes.

When it comes to choosing among data protection options, Preston says there's no set rule about which combination to deploy. "It's rather complicated," he says. "There's no reason to deploy a mix [of technologies]. You might choose Exchange-specific CDP because you want server-level, user-level and message-level restores with a single backup solution. You'd choose traditional [tape-based backup] if you're cheap."

In the end, the important questions have to do with business outcome: What is your recovery time objective, and how often do you expect you'll need to restore? The answer to the latter question can affect how long you choose to retain Exchange-related backups on disk before overwriting them, says Preston.

And when you broaden the messaging field to include instant messaging services, you enter the archiving arena, Preston says. "There is no backing up IM. There is archiving IM," he says. "There's no 'store' associated with it. It's just a stream of consciousness, like backing up a phone call."

Here, you might look at deploying an enterprisewide IM system with hygiene suites that help stop IM-related viruses and malware and allow you to log and monitor IM traffic. Many products can integrate with popular e-mail archiving and enterprise content management applications so that the IM exchange can be saved and searched later in the event of governmental or legal inquiries. Popular IM-related products include IBM's Sametime, Jabber Inc.'s JabberNow and Microsoft's Live Communications Server, as well as IM hygiene appliances like Akonix Systems Inc.'s Akonix L7 Enterprise and Akonix A1000, and CipherTrust Inc.'s IronIM.

Backup or Archive?

Preston reiterates that the choice between backup and archiving comes down to what you are trying to accomplish. True backups don't need to get saved very long — probably for a maximum of 90 days — and are performed to recover data if the e-mail database is damaged, the server catches fire or the disk drive dies, for example. "Archives, on the other hand, are used not to recover data, but to retrieve data," he notes.

Osterman says the distinction between backup and archiving is more of a continuum of capabilities. "Backup is really used to restore data in the event of a server crash. Archiving is intended to restore information in support of corporate goals," he explains.

Osterman maintains that most organizations have made good progress in their messaging backup practices but still have significant catching up to do when it comes to e-mail archiving. This includes understanding the risks involved in not doing it, such as the cost of adequately fulfilling an e-discovery request if you are hit with a lawsuit. "One firm had to use a forensic firm to go through 15 backup tapes" in response to a discovery request, he says. "They paid $78,000 per tape."

Osterman recommends an e-mail archiving plan for any company with more than 25 employees. The common practice that most perform, he says, is to archive first to disk, where the disk is on some type of secondary storage or write-once, read-many storage. Then that archive is backed up to tape or some secondary locale from there.

Organizations often combine the archive function with e-mail management tools such as Symantec Corp.'s Enterprise Vault and Zantaz Inc.'s EAS. Besides streamlining searches of e-mails, many of these products also work closely with the underlying storage system to pare down the size of the original e-mail database. This type of software now uses deduplication, compression or what is commonly known as single-instance storage to eliminate duplicate attachments during the archive process. They also leave "stubs" or markers of actual messages that have been archived.

These vendors often claim that archiving of messages and the removal of duplicates can reduce the size of the original message store by as much as 60% to 70%. That also makes the act of performing specific backups of the store much more manageable.

Hope is a freelance writer who covers enterprise storage and networking issues. She can be reached at mhope@thestoragewriter.com.

THE LEGAL BURDEN

REGULATIONS requiring e-mail messages, which are considered legal records, to be retained for a predefined period from their creation date has put a wrinkle in traditional e-mail backup practices.

According to Postini Inc., a message management firm in San Carlos, Calif., regulations affecting e-mail backup and archiving include the following:

The Sarbanes-Oxley Act of 2002: Requires that all records, including e-mails, be kept for at least five years.

The Fair Labor Standards Act and the National Labor Relations Act: Require certain human resources records to be retained for three years.

The Employee Retirement Income Security Act of 1974: Requires any correspondence, notes or inquiries related to individual eligibility determinations to be retained indefinitely. Requires wage and hour records to be retained indefinitely or for six years after the date of lump-sum distribution (to determine retirement benefits).

The Americans With Disabilities Act: Requires personnel records of employees who were involuntarily terminated to be retained for one year from the date of termination.

The Occupational Safety and Health Act: Requires that records of legally required medical examinations be retained for the duration of employment plus 30 years.

Title VII of the Civil Rights Act of 1964: Requires personnel records concerning any discrimination charge brought by any agency or individual to be stored until final disposition.

Some experts advise setting specific start and end dates for retention of e-mails within a specific messaging archive. Once the retention period ends, experts recommend that the related message be immediately deleted, to minimize corporate risk.

– MICHELE HOPE

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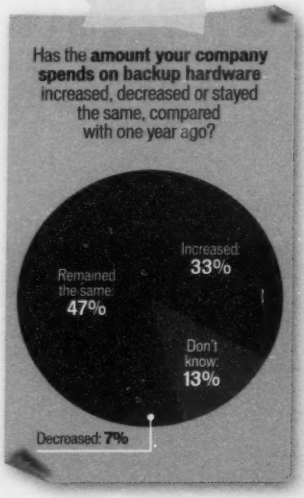
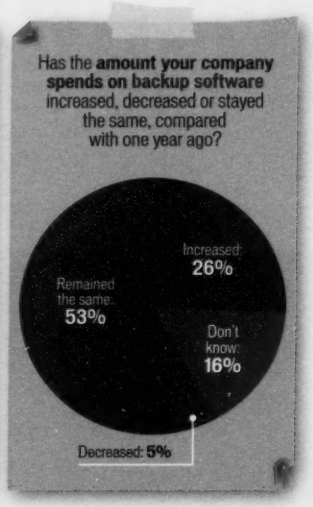
Research Insights

NEARLY HALF of the 287 IT professionals who participated in *Computerworld*'s exclusive data backup survey reported that the top executives at their companies know how critical backup technology is and spend accordingly. And 70% of the respondents reported only an occasional hiccup in their backup procedures. Yet some gaps remain: 54% said that less than half of their IT staffers are well versed in their department's backup procedures, and nearly one-third said that their companies' backup procedures aren't documented. See more charts at Computerworld.com.


Has the **amount your company spends on backup hardware** increased, decreased or stayed the same, compared with one year ago?
Increased: 33%
Remained the same: 47%
Don't know: 13%
Decreased: 7%


Has the **amount your company spends on backup software** increased, decreased or stayed the same, compared with one year ago?
Increased: 26%
Remained the same: 53%
Don't know: 16%
Decreased: 5%

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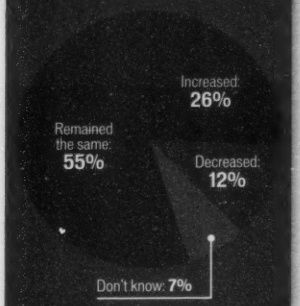
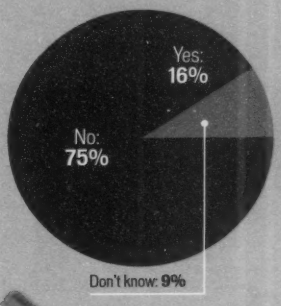


Has your company **lost stored data** in the past six months?



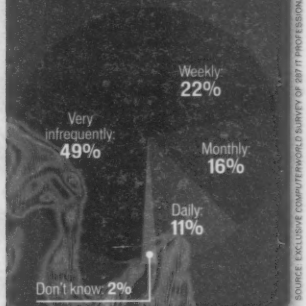
Of those who said yes, from **where was the data lost**?*

Desktops	50%
File servers	43%
Data center	28%
Branch offices	24%
Wireless devices, PDAs	22%
Messaging technologies, including e-mail and IM	13%
Workgroups	7%
Other	9%

BASE: 46

*Respondents could choose all that apply.

How often is your IT department **asked to retrieve data** from backup?



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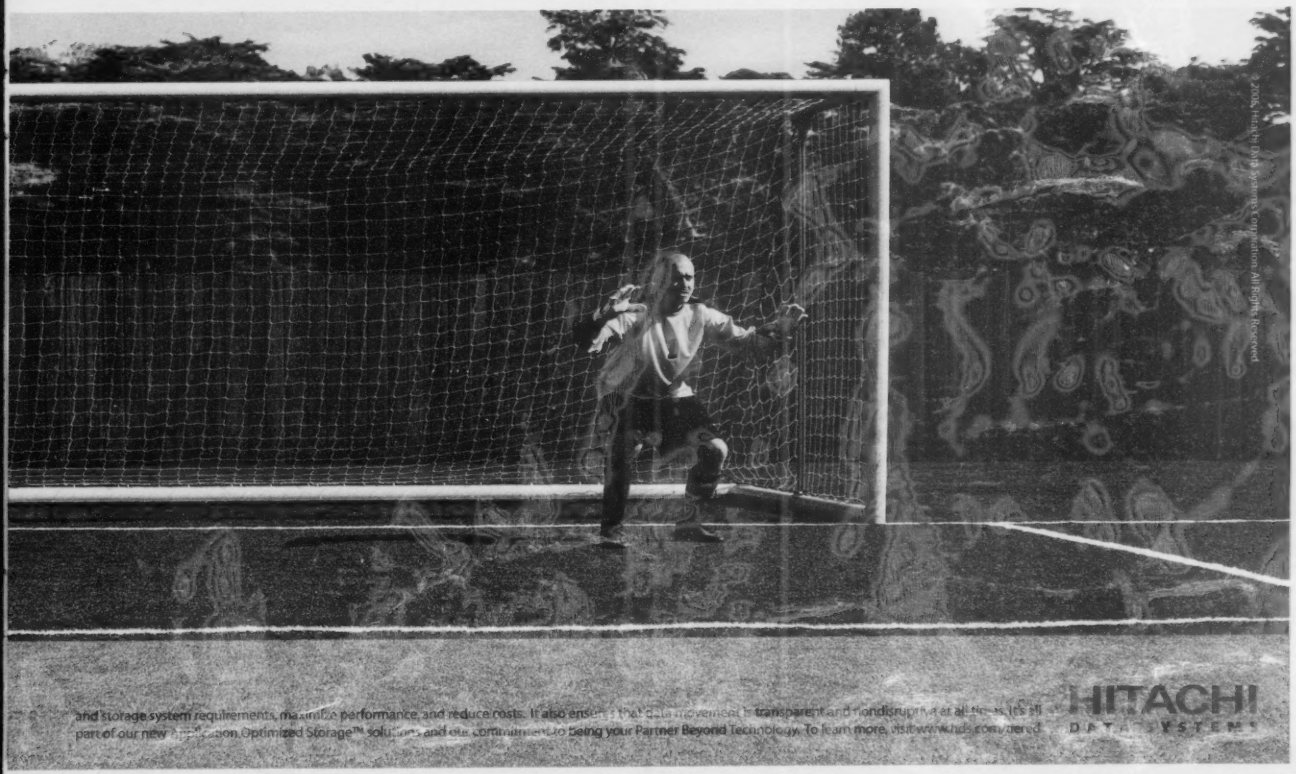
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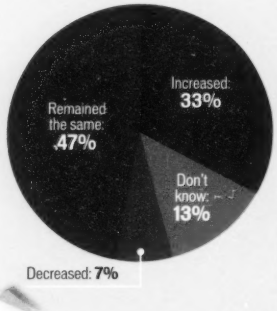

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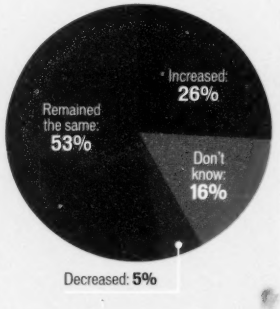

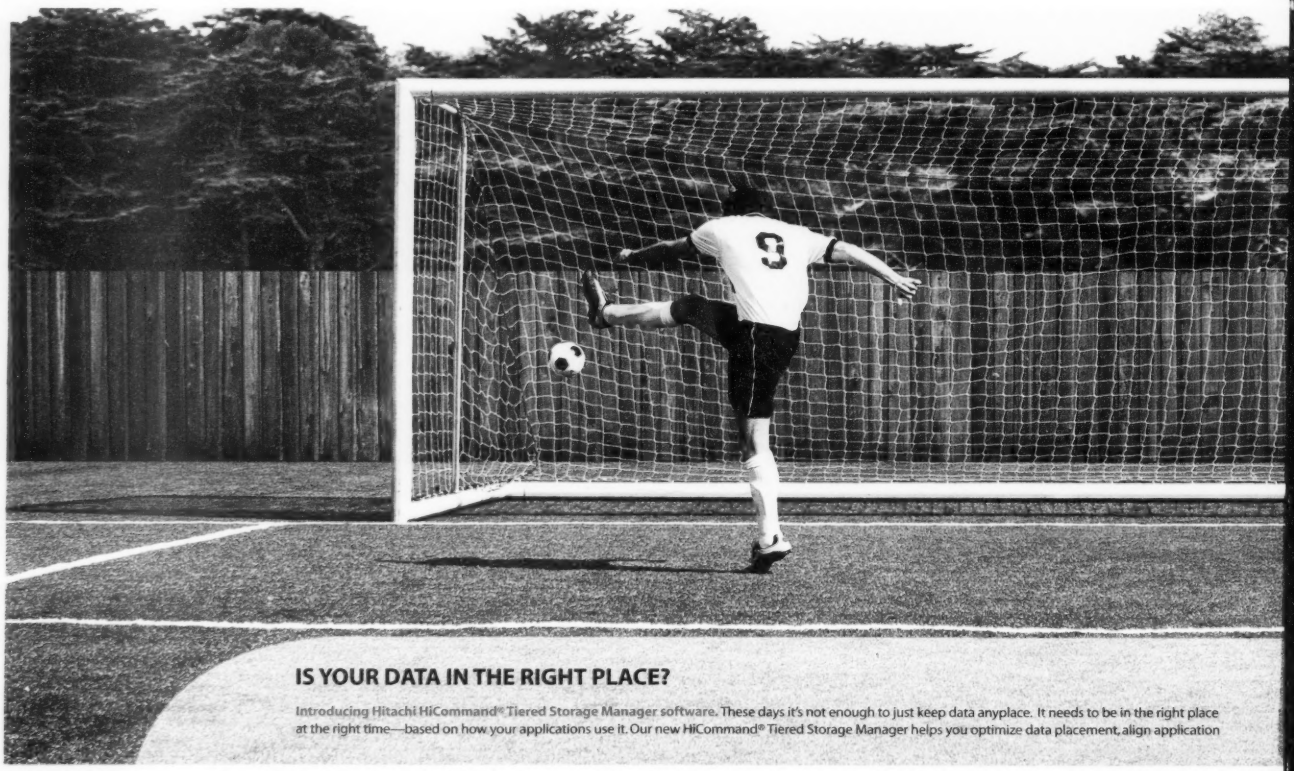
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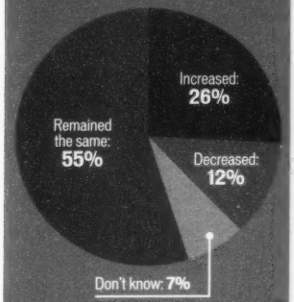

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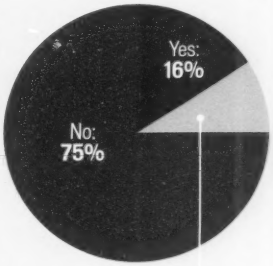

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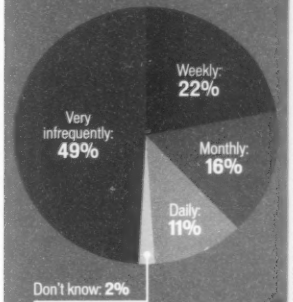

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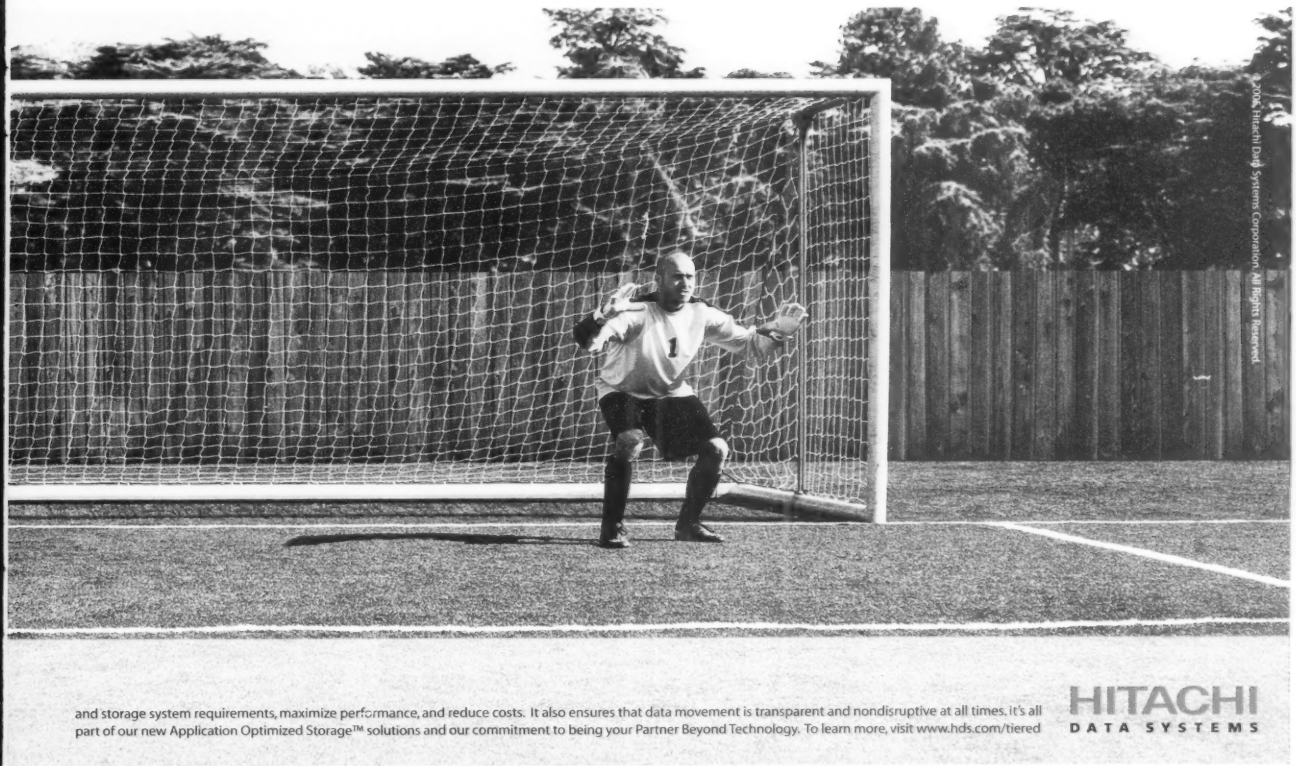

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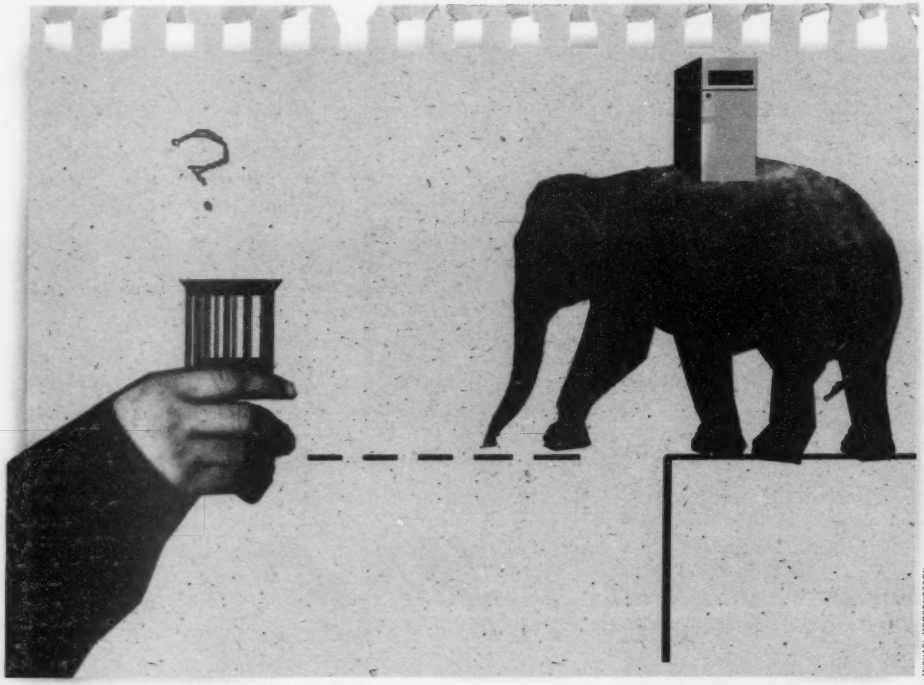

MICHAEL MORGENSTERN

Workgroups

Find the backup that fits your size. Don't try to trim back large-scale software to fit a smaller workgroup.

By Stacy Collett

WORKGROUP administrators know the drill: Wait until system users go home at the end of the day, shut down the server, run the backup overnight, and come back in the morning to collect the finished product. If the system crashes tomorrow afternoon and data is lost, just restore last night's data. It's that simple, right?

Not anymore. As companies have become more dependent on constantly changing electronic data and that data is increasingly subject to more regulation, the old drill just isn't good enough, storage experts say.

The amount of data requiring backups is growing exponentially, thanks in part to the popularity of audio, video and graphics files. Some 381 million drive units were shipped worldwide in 2005, up 24.4% from a year earlier, according to market research firm IDC. That means a tremendous volume of new data needs to be protected.

Computing workgroups face unique challenges when it comes to system backups. These groups, of usually two to 50 people, use collaboration software that allows them to update and pass along files. LANs designed around workgroups provide electronic sharing of required data. These workgroups can operate on their own or within an enterprise and are typically outside the data center. Workgroup staffers often have little or no administrative IT experience, yet they are usually responsible for these backups.

"The backup is being built on this traditional model," says Agnes Lamont, a spokeswoman for the Storage Networking Industry Association (SNIA), a nonprofit industry group with 460 member companies worldwide. "But we have to find and present users with better, easier, more complete solutions for backing up."

Thanks to new software products and services, workgroups can now back up smarter.

Pitfalls to Avoid

Today's computing workgroups leave gaps in their backup and recovery procedures when they make these common mistakes:

1. Choosing tape over disk. One of the biggest mistakes that a small workgroup can make is backing up data to tape drives instead of to disks, says Marc Staimer, founder of Dragon Slayer Consulting in Beaverton, Ore., which focuses on storage, networking and software. "It has an incredibly high failure rate" and requires more advanced IT skills, he says.

2. Storing backups on-site. Copying data is only half of the storage solution. The backup needs to be stored at another location in case of a fire, a flood or another disaster.

3. Cutting backups short. As the amount of data grows, the amount of time needed to back up data increases. Sud-

Continued on page 54

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FILE SERVER BACKUP VS. NAS BACKUP

THE SAME RULES APPLY whether you're backing up workgroups or file servers, storage experts say. But network-attached storage devices play by different rules. Most have their own built-in data protection, which is as effective in many ways as add-on products, says Marc Staimer, founder of Dragon Slayer Consulting.

Lauren Whitehouse, an analyst at Enterprise Strategy Group Inc. in Milford, Mass., says, "Many workgroups use NAS filers because they are easy to install and deploy, the up-front cost is low and the support time is minimal. If NAS filers have to be backed up, backup applications that provide Network Data Management Protocol support are best."

– STACY COLLETT

Continued from page 52

denly, that overnight backup window isn't big enough and backups don't finish in time, so some backups are incomplete. Employees who work after regular hours may also interfere with backup schedules.

4. Using enterprise-grade software. Many workgroups inside the organization try to use the same backup software as the rest of the organization.

Arun Taneja runs a small data storage research firm in Hopkinton, Mass., with a handful of employees who share files and data in a workgroup-type environment. But even the storage expert has a hard time meeting his firm's data protection needs.

"Data protection is a nightmare in this environment," says Taneja, founder of Taneja Group. "There's not a [large] storage vendor in the entire industry that wouldn't send me free software and support in a heartbeat. But I still have a hard time finding something very reasonable for the small environment."

Without adequate backups, some companies in the financial or health care sectors might not be in compliance with applicable regulations because their workgroup backup data isn't protected.

For instance, if you're inside a financial services firm, the same Securities and Exchange Commission rules apply to the workgroup in that company, explains Taneja. If you have communication with a broker/dealer, or if you have any communication with a client, the data must meet backup requirements.

Look to Automation

It's time for workgroups to get back to the basics, Lamont says. "Try to automate what can be automated, and spend fewer resources on the mechanics of doing it," she adds.

Think about the data, the applications and the business processes they're supporting, and determine an acceptable level of protection. How often does the data change? Can the data be re-created with the current backup schedule? If the data did suffer corruption or a site outage, what data would be needed to stay in business? What are the recovery time objectives? Based on your answers to those questions, consider these options:

1. Outsource to a backup service. Many storage analysts agree that the easiest and most complete solution for workgroup backups is through a backup service provider. "You don't have to buy any tape or disks or pay a license fee," Staimer says, and as a small-business owner, "[the less I] have to do with my infrastructure, the more time I can devote to making money."

2. Install a backup product tailored to small groups. Don't use enterprise-grade software made for the data center and "clip its wings" to accommodate a smaller group, Taneja says. "That's what many vendors are doing now, but the product needs to be simpler and more intuitive," he adds.

Several products have emerged that cater to workgroup backups, including EMC Corp.'s Insignia, Unitrends Software Corp.'s Unitrends Data Protection Unit and Yosemite Technologies Inc.'s Backup Simplified.

3. Find a system that replicates off-site. Workgroups can also buy software that allows them to create on- and off-site backups automatically using disks. "I wholeheartedly believe that the entire backup system should be built on disk," says W. Curtis Preston, vice president of data protection services at storage consultancy GlassHouse Technologies Inc. in Framingham, Mass.

"[Workgroups] are not going to swap a tape," because the amount of data is too small, he says. Plus, disk drives can cost three to five times more than a tape drive. "It's going to be more reliable, and it allows you to use some backup software that can replicate that backup off-site," Preston says.

Products that feature off-site replication include Avamar Technologies Inc.'s Axion and Replicator, Asigra Inc.'s Televaulting software, and the Symantec Norton Ghost 10.0 peer-to-peer disk software from Symantec Corp., to name a few. These products reduce to a bare minimum the amount of data that has to be sent off-site and replicated.

Open-source packages for Linux-savvy users include BackupPC, Backula, Amanda and Rsnapshot. "They have pretty good [development] communities behind them," Preston says.

4. Back up more often. Depending on the importance of the data, your information should be backed up every day at a minimum, Preston says. For companies that must comply with regulations such as the Health Insurance Portability and Accountability Act or the Sarbanes-Oxley Act, continuous data protection (CDP) might be a smart choice. With CDP, data is backed up as it's written to the hard drive and revisions are stored.

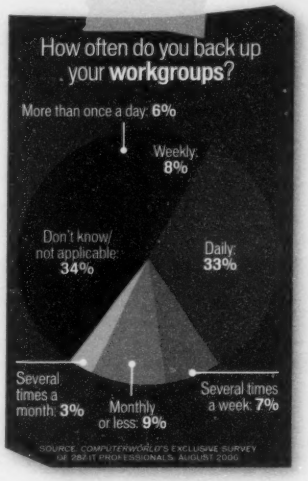
Some industry watchers say the method overburdens networks and individual computers and makes file revision management difficult. Others say that since only the changes are being duplicated, the amount of new data isn't too large.

"You're ultimately adding 0.4 to 2.5 times the amount of disks you would have had with a primary backup," Staimer says.

CDP can be particularly important for specialized workgroups, according to SNIA's Lamont, who leads a special interest group on the service for the association. Candidates for CDP include workgroups that support research, such as biotechnology groups working on cures for diseases, or insurance companies that accept time-sensitive updates to customers' coverage electronically.

To date, however, there are few truly "continuous" data protection choices available for the small-business crowd, Preston says. Microsoft Corp. and Symantec have "near-CDP products," he says. "Those are based on snapshots. You're only keeping what it finds every hour. A true CDP product replicates everything within the [parameter] that you tell it to keep." TimeSpring Software Corp. and Atempo Inc. offer products that recover data at any point in time, he adds.

Lamont strongly encourages workgroups to test their recovery operations before an emergency happens. "No matter what solution you have," he says, "you're better off finding out if it has any inadequacies before you're in a stressful situation."


How often do you back up your workgroups?
More than once a day: 6%
Weekly: 8%
Daily: 33%
Don't know/ not applicable: 34%
Several times a month: 3%
Monthly or less: 9%
Several times a week: 7%
SOURCE: COMPUTERWORLD'S EXCLUSIVE SURVEY OF 288 IT PROFESSIONALS, AUGUST 2006

Collett is a Computerworld *contributing writer. Contact her at stcollett@aol.com.*

10 Tips for Backing Up Your Workgroups

1. **Outsource to a backup service**, or if that's not possible…
2. **Determine what needs to be backed up** and how often it needs to be recovered.
3. **Designate one or two people** to be in charge of backups.
4. **Install a backup product** tailored to small groups, not enterprises.
5. **Back up to disk rather than to tape.**
6. **Find a system that replicates off-site.**
7. **Consider continuous data protection** if your industry is highly regulated.
8. **Maintain backup logs,** or use reporting tools for auditing and visibility.
9. **Back up every day** at a minimum – sometimes twice a day.
10. **Test your backup system** before an emergency.

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8:40am to 9:20am	**Market Overview and Trends** Patrick Moroney, President & Partner, The Barnier Group LLC
9:20am to 10:00am	**Application Performance at Direct Energy: An End User Case Study** David Cefai, Vice President, IT, Direct Energy
10:00am to 10:15am	**Refreshment and Networking Break**
10:15am to 10:50am	**Application Performance Assurance Case Studies: It Pays to be Predictable** Elizabeth Maly, Vice President, Application Performance Solutions, Compuware
10:50am to 11:25am	**Application Performance at Detroit Medical Center: An End User Case Study** Michael LeRoy, Senior Vice President & Chief Information Officer, Detroit Medical Center
11:25am to Noon	**Panel Discussion** Moderator: Dan McLean, Editor in Chief, IT World Canada Panelists: David Cefai, Vice President, IT, Direct Energy; Michael LeRoy, Senior Vice President & Chief Information Officer, Detroit Medical Center; Patrick Moroney, President & Partner, The Barnier Group LLC

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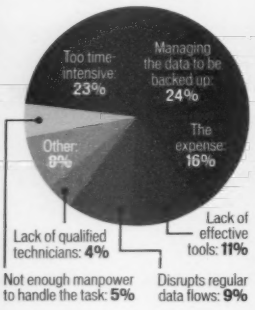
Clearing the Clutter

What's the biggest challenge to backing up or storing data at your company?


Too time-intensive: 23%
Managing the data to be backed up: 24%
Other: 8%
The expense: 16%
Lack of qualified technicians: 4%
Lack of effective tools: 11%
Not enough manpower to handle the task: 5%
Disrupts regular data flows: 9%

Net Deposits

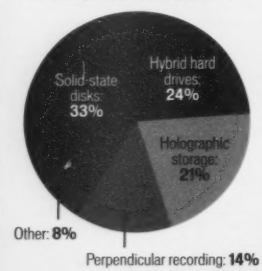
Which of the following backup methods are currently used at your company?*

1	Network backup	63%
2	Digital tapes	56%
3	On-site backup	45%
4	Optical storage	32%
5	Removable hard drives	31%
6	Online backup	6%
7	Other	7%

* Respondents could choose all that apply.

Help on the Way

What emerging backup technology do you feel holds the most promise for the future?



SOURCE: COMPUTERWORLD'S EXCLUSIVE SURVEY OF 287 IT PROFESSIONALS, AUGUST 2006

MARK HALL

Future Cache

SERVER PERFORMANCE has skyrocketed over the years because microprocessor speeds, whether measured in MIPS or gigahertz, have risen tremendously. Also, CPUs got vastly better at using memory. Today, servers can be packed with gigabytes of RAM, so their applications make fewer calls to storage systems. The last thing any application developer wants to do is write code that depends on data that resides on a pokey disk drive.

However, in a highly transactional world, some data is destined to be tucked away on a disk drive that can drag application response time to embarrassingly slow levels. For many, the disk drive has become *the* primary bottleneck in application performance. But things may be changing.

"It's absolutely a big problem," says Tom Ruwart, an industry consultant at I/O Performance Inc. in Fridley, Minn. He's working with the U.S. Department of Energy on exactly how to get data off a disk faster. The DOE is concerned that it won't be able to deliver the massive data feeds its ultrafast supercomputers need to solve high-energy physics problems.

Ironically, one of the main stumbling blocks to boosting storage systems performance is physics itself. Platters inside a drive can spin only so fast, and the head used to read data on those platters moves only so quickly. These aren't digital issues. They're physical and conform to laws set down by the likes of Newton and Einstein, not Gordon Moore.

Sadly then, drive makers have been putting most of their R&D into capacity, not performance improvements. In 1984, 20MB drives were the cat's pajamas. Today, manufacturers brag about parking up to 500GB of data on a single device. But that has actually compounded the problem, observes Tom Coughlin, president of Atascadero, Calif.-based consultancy Coughlin Associates.

"Data latency has actually gotten longer on bigger drives when you want to get to a particular piece of information," he says. That's because while capacity has experienced a 250,000-fold improvement in two decades, the average I/O operations per second (IOPS) has merely doubled from 85 IOPS to 170 IOPS.

MARK HALL is a Computerworld editor at large. Contact him at mark_hall@computerworld.com.

Most experts say that if you have a storage bottleneck, you should design applications with a hierarchical, cache-rich storage infrastructure in mind. But consultant Tom Gardner of System Surety Group in Los Altos, Calif., says most IT shops don't bother. "It's easier to just throw disks at the problem," he laments.

Ruwart agrees. In some places, he says, data centers are packed with underused drives that have been "short-stroked." That is, the heads are frozen at the edge of the platter where the data is intentionally placed so they don't have to move when grabbing data. That's a waste of operational resources and budget.

You would think drive makers would see situations like short-stroking and create smaller, faster drives and package them as a single managed device, such as Ruwart and others propose. Alas, given that profit margins for larger drives are better than for smaller ones, I don't see that as a likely scenario. There's definitely room here for start-ups to unseat traditional storage vendors, especially for transaction-heavy applications.

Cache In

Until such devices reach the market, caching remains the best way we know of today to mitigate the storage bottleneck. Yet re-architecting applications to leverage cache isn't very realistic.

But if you could get your hands on a centralized cache that plugs into your network and can serve any number of applications and their existing storage systems, would you grab it? A Silicon Valley newbie hopes so.

Gear6 in Menlo Park claims its soon-to-be-shipped Cachefx RAM appliance does just that. According to Gary Orenstein, vice president of marketing, you simply plug Cachefx into your data center's Gigabit Ethernet, point it to the application servers you want it to support and indicate which storage units are involved. And you're done. All requests for data go through Cachefx. All writes of new data are noted by the system but are passed through to the disks for safekeeping. Orenstein says Cachefx holds 5TB of data — all in RAM.

It's impossible to pass judgment on a device that hasn't been market-tested and hasn't been priced as of this writing. (Gardner wisely notes that with enough money, any technology issue can be solved, but it's not always worth the price.) Still, the Gear6 approach is elegant. It takes the familiar caching concept of CPUs and moves it to the network, just as we moved storage from being tied to a server to being part of a shared network resource. So, while the proof will be in the pudding, it's great to see innovation in storage technology, if not disk drives, that challenges the microprocessor as the sole source for boosting application performance.

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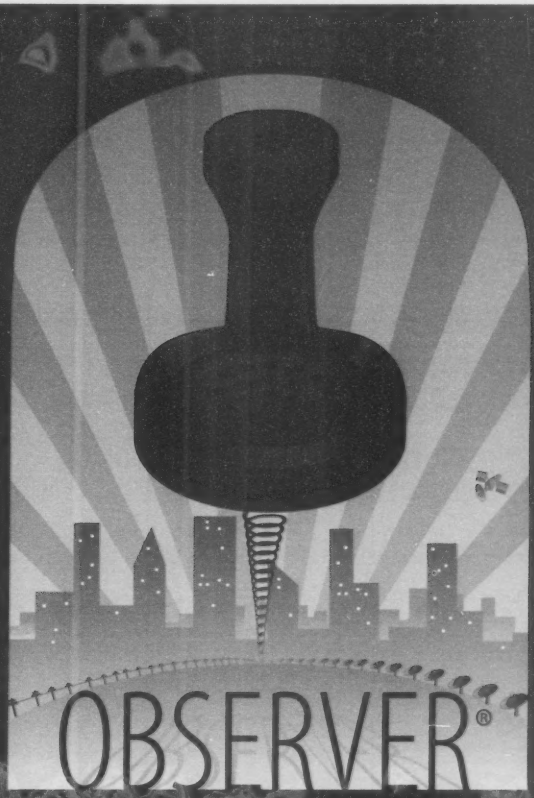

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ACCENTURE LTD. 14
ACPANA BUSINESS SYSTEMS INC. 42
ACRONIS INC. 40
AKONIX SYSTEMS INC. 48
ALASKA DEMOCRATIC PARTY 1
ALASKA DIVISION OF ELECTIONS 16
AMBERWAVE COMMUNICATIONS 42
AMERICAN UNITED LIFE INSURANCE CO. 14
AMERIVAULT CORP. 42
ASHLEY LAURENT INC. 14
ASIGRA INC. 54
AT&T GLOBAL NETWORK SERVICES INDIA PVT. 18
AT&T INC. 14, 18
ATEMPO INC. 42, 54
AUSTRALIA DEPARTMENT OF DEFENCE 18
AVAMAR TECHNOLOGIES INC. 54
AVAYA INC. 21
BACKUP.COM 42
BANK OF MONTREAL 14
BELL CANADA 6
BELLSOUTH CORP. 14
BLACK BOX VOTING 16
BORLAND SOFTWARE CORP. 62
CANADA HEALTH INFOWAY INC. 14
CANOPY VENTURE PARTNERS LLC 8, 62
CEDARVILLE UNIVERSITY 14
CHARTER BANK 6
CINGULAR WIRELESS LLC 8
CIPHERTRUST INC. 48
CISCO SYSTEMS INC. 6, 14, 20
CISCO-LINKSYS LLC 14
CLEVERSAFE LLC 12
COLLOQUIS INC. 6
COMPUTER CORPS LLC 12
CONTINENTAL AIRLINES INC. 21
COUGHLIN ASSOCIATES 56
CURRENT ANALYSIS INC. 20
DATAVAULT INC. 42
DEUTSCHE TELEKOM AG 14
DIEBOLD ELECTION SYSTEMS 1
DRAGON SLAYER CONSULTING 52, 54
E360INSIGHT LLC 12
EMC CORP. 40, 54
ENTERPRISE MANAGEMENT ASSOCIATES 34
ENTERPRISE STRATEGY GROUP INC. 8, 30, 54
EPIC SYSTEMS CORP. 60
EURONEXT NV 20
EUROPEAN CENTRAL BANK 18
FEDERAL COMMUNICATIONS COMMISSION 14
FENWICK & WEST LLP 6
FORCE10 NETWORKS INC. 20
FORUM OF INCIDENT RESPONSE AND SECURITY TEAMS 6
GARTNER INC. 6, 14, 24
GCR CUSTOM RESEARCH LLC 12
GEARS 56
GEISINGER HEALTH SYSTEM 60
GENERAL ELECTRIC CO. 62
GLASSHOUSE TECHNOLOGIES INC. 30, 46, 54
GOOGLE INC. 14, 62
GROENENDAAL UITGEVERIJ BV 18
HEWLETT-PACKARD CO. 6, 20, 21
HUTCHISON ESSAR LTD. 18
I/O PERFORMANCE INC. 56
IBM 6, 12, 20, 40, 48, 60
IDC 30, 52, 60
ILLINOIS INSTITUTE OF TECHNOLOGY 12
INFOSYS TECHNOLOGIES LTD. 18
INSTANTIATIONS INC. 12
INTEGRITY CORP. 6
INTEL CORP. 12, 21
INTRONIS LLC 42
IOMEGA CORP. 42
IRON MOUNTAIN INC. 42
ITT TECHNICAL INSTITUTE 8
J. GOLD ASSOCIATES 44
JABBER INC. 48
KAISER PERMANENTE 16
KAZ GROUP PTY. 18
LEFTHAND NETWORKS INC. 46
LIGHTEDGE SOLUTIONS INC. 30
MAXTOR CORP. 40
MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH 60
MCAFEE INC. 6
MICROSOFT CORP. 6, 8, 12, 14, 18, 46, 48, 54, 62
MICROSOFT DEUTSCHLAND GMBH. 18
MIMOSA SYSTEMS INC. 48
MORGAN STANLEY 28
MOTOROLA INC. 14
NCR CORP. 6
NETWORK APPLIANCE INC. 48
NETWORK FRONTIERS LLC. 28
NEW YORK STOCK EXCHANGE 20
NEW YORK-PRESBYTERIAN HEALTHCARE SYSTEM 60
NEWTECH INFOSYSTEMS INC. 42
NORTEL NETWORKS CORP. 8, 20
NORTH BAY BANCORP 24
NOVA-STOR CORP. 42
NOVELL INC. 8, 12, 62
NOVELL OAKLAND BAY AREA USERS GROUP 8
NUCLEUS RESEARCH INC. 16
NV NEDERLANDSCHE APPARATENFABRIEK 18
NYSE GROUP INC. 20
OHIO UNIVERSITY 1
ORACLE CORP. 6, 16
OSTERMAN RESEARCH INC. 46
POSTINI INC. 48
PRICEWATERHOUSECOOPERS 42
PROVIDENCE HEALTH SYSTEM 14
PURDUE UNIVERSITY 20
RED HAT INC. 20
REGISTER.COM 42
RESEARCH IN MOTION LTD. 18
ROBERT FRANCES GROUP 21
RUCKUS WIRELESS INC. 14
SAN GABRIEL VALLEY NOVELL USERS GROUP 8
SAP AG 16, 30, 44
SCOTTISH POWER PLC 18
SIEBEL SYSTEMS INC. 44
SOCIETY FOR WORLDWIDE INTERBANK FINANCIAL TELECOMMUNICATION 18
SPAMHAUS PROJECT LTD. 12
SPRINT NEXTEL CORP. 8
STARDOCK CORP. 42
STORAGE NETWORKING INDUSTRY ASSOCIATION 52
STROHL SYSTEMS GROUP INC. 14
SUN MICROSYSTEMS INC. 12, 20
SUSE LINUX AG 8
SWAPDRIVE INC. 42
SYMANTEC CORP. 14, 40, 48, 54
SYSTEM SURETY GROUP 56
TANEJA GROUP 54
TECHBETA.ORG 12
TELSTRA CORP. 18
THE 451 GROUP 30
THE ENDERLE GROUP 8
THE HENSSLER FINANCIAL GROUP 6
THEINFOPRO INC. 30
TIMESPRING SOFTWARE CORP. 54
TIPPINGPOINT 12
TIVOLI SOFTWARE 40
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U.S. DEPARTMENT OF DEFENSE 16
U.S. DEPARTMENT OF ENERGY 56
U.S. DEPARTMENT OF HOMELAND SECURITY 18
U.S. DEPARTMENT OF JUSTICE 6, 14
U.S. SECRET SERVICE 18
U.S. SECURITIES AND EXCHANGE COMMISSION 54
UBS WARBURG 28
UNISYS CORP. 6
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UNIVERSITY OF CALIFORNIA BERKELEY 16
UNIX SYSTEMS LABORATORIES 8
VERISIGN INC. 14
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YOUTUBE INC. 14, 62
ZANTAZ INC. 48
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CA www.ca.com 37
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Hewlett-Packard Enterprise www.hp.com 64
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SAS www.sas.com 13
SonicWall www.sonicwall.com 43
Storage Networking World www.snwusa.com 61
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Ultidom www.ultidom.com 53

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Continued from page 1

OU Firings

be reached last week for comment on the grievance committee's recommendations or when she expects to issue her ruling.

The grievance committee said that Todd Acheson, who was OU's Unix systems manager, and Thomas Reid, its former director of communication network services, should receive back pay and benefits and that the Athens, Ohio-based school "should make a good-faith effort to find suitable employment" for them.

Ten days before Acheson and Reid were fired, the jobs they held were eliminated as part of a reorganization of OU's IT department. The grievance committee wrote that if other positions aren't available for them now, they "should remain under contract for the remainder of the academic year and be provided with assistance in finding external employment."

The committee's letter said there was "ample evidence" that both men were fulfilling the specific security roles in their job descriptions and that OU's security problems didn't stem from their work. "There was no clear duty or authority granted to Mr. Reid or Mr. Acheson . . . to implement a plan for total network security," the panel wrote.

A large part of the problem, the grievance committee added, was that Sams didn't "appreciate the gravity of IT problems" at OU before the security breaches were discovered. The school's IT staff had been "fragmented and disjointed for many years," the panel wrote, noting that the department's "dysfunctional organizational structure and [its] lack of leadership continuity were exacerbated by the strong personalities of Mr. Reid and Mr. Acheson."

Sams' failure to address those issues within the first six months after he became CIO in September 2004 "was inappropriate for this level of administration," the grievance committee wrote.

Sams declined to comment last week on the grievance committee's letter but said he awaits Krendl's final ruling on the possible rehiring of Acheson and Reid. "Obviously, I will abide by her decision," said Sams, who announced in July that he would resign once his replacement is found.

Both Acheson and Reid said they were happy with the committee's findings.

"To have an independent committee vindicate Tom Reid and myself is a wonderful thing," Acheson said. "It just supports the story we've been telling all along, that our firings were unjustified."

"I'm very pleased with this first step in clearing my name," Reid said. "I'm cautiously optimistic that the university and I will be able to put this situation behind us."

Frederick Gittes, a Columbus, Ohio, attorney who's representing Acheson, called the committee's report "the first step in a long process of [both men] getting their reputations back."

A total of five security breaches came to light at OU in April, May and June. A break-in on a server that supported alumni relations exposed personal data belonging to about 137,000 people and went undiscovered for more than a year. A similar incident on a system at the school's health center may have exposed Social Security numbers, dates of birth, patient IDs and clinical information on nearly 60,000 individuals.

Acheson and Reid were first suspended from their jobs in June and then fired. In addition to their internal grievances, a lawsuit that was filed against the university on their behalf is pending in a court in Athens County, Ohio.

The discovery of the first three breaches prompted the school to hire a consulting firm to conduct a sweeping review of its systems and IT organization. The review uncovered the other two breaches, and the consultants recommended a restructuring in IT to eliminate what they described as a siloed culture with combative relationships among different groups.

In late July, Sams and Krendl announced a 20-point IT action plan that included a series of technology investments and procedural and organizational changes.

Health Care Group, IBM to Build Integrated Patient Data System

BY HEATHER HAVENSTEIN

Geisinger Health System and IBM have started a joint effort to develop a system for integrating patient data with billing, claims, financial and other systems to improve patient care.

PAULUS says the new data warehouse will help Geisinger find the best treatments for patients.

Under the agreement announced last week, IBM and Geisinger will build a tool called the Clinical Decision Intelligence System to mine data that can be used to create customized treatment plans, ensure that patient care meets national standards and identify health care best practices.

Geisinger is one of a handful of health care operations, including New York-Presbyterian Healthcare System and the Mayo Foundation for Medical Education and Research, that have started to integrate and mine electronic health record (EHR) data for best practices and suggested treatment plans.

The joint effort will begin with an 18-month to two-year project to build a DB2-based data warehouse to store medical, insurance, financial and other data on about 2.5 million Geisinger clients. The project includes patients of the Danville, Pa.-based company's 650 physicians, three hospitals, a research center and clients of its health insurance company, the Geisinger Health Plan, said Ronald Paulus, Geisinger's chief technology and innovation officer.

Paulus declined to disclose the cost of the joint project, which will use open-standards-based and other technologies.

He did note that Geisinger has so far spent about $70 million to build an EHR system. It began work on the EHR system, based on software from Epic Systems Corp., about 10 years ago.

Mining data from the new warehouse will allow Geisinger to study all of its patients to determine which treatments work best for specific maladies, Paulus said.

Because Geisinger's EHR has been adopted by all of its physicians and facilities, the provider has reached a "quasi-endpoint in how far we will get in simple decision-support functions," he added. "The big gap is not installing systems but changing the way we care for patients fundamentally from the bottom up."

Many Expected Uses

Once the warehouse is in place and being used to compare treatments against best practices, Geisinger will look at further uses, such as researching the best medicine for patients based on genetic makeup and more quickly identifying candidates for clinical trials, said Paulus. Other uses may include identifying treatment plans based on a patient's preferences, such as a willingness to have surgery or whether to risk the side effects of certain medicines, he added.

Brett Davis, IBM's global solutions executive for health care, said that IBM hopes one day to use the Geisinger project as a model for other health care organizations.

He noted that Geisinger's breadth of services is representative of many companies in the health care business. For example, Geisinger serves patients from rural and suburban areas, includes a large physician practice and performs some clinical research.

Scott Tiazkun, an analyst at market research firm IDC, said Geisinger and IBM should be able to tackle the two main challenges of this type of project — the cost and the technical issues — by using at least some open standards.

However, he said, creating templates that could be applied at other health care organizations might be tricky.

If IBM can create technology templates that directly translate to other providers' IT landscapes, then such a model could work, Tiazkun said.

But, he added, "if each landscape is unique — as I suspect — then I think the cost of these projects will remain high, and well-moneyed providers like Geisinger can afford to create these IT systems, but smaller providers will be left behind."

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FRANK HAYES ■ FRANKLY SPEAKING

Ray Noorda

RAY NOORDA died last week. He was 82. The news didn't even register at CNN, where the big IT industry story was Google buying YouTube for $1.65 billion in stock. And on that one, the business deep-thinkers were baffled by the contradiction. How could YouTube possibly be worth that — YouTube, with no revenue, a major potential for big-ticket lawsuits and a pair of twentysomething founders running the asylum? Why would Google want it at *any* price, never mind $1.65 billion?

I think Noorda would have laughed. Not the tragic Alzheimer's-ridden shell that Noorda became in his last years, but the canny businessman who baffled plenty of deep-thinkers himself — and who knew the value of a twentysomething's ideas.

Noorda was a bundle of contradictions. He was an electrical engineer who quit his job at General Electric to become a management consultant. He turned around several failing Silicon Valley companies as CEO, but in his spare time he was trying to figure out how to wire together two small computers to make them fault-tolerant.

When he was asked in 1982 by a failing computer maker to become its president, hardware-guy Noorda wasn't much interested in the computers that Novell was trying to sell. What caught his eye was a skunk works software project for networking PCs, hammered together by a trio of kids in their 20s who weren't even regular employees: Drew Major, Dale Neibaur and Kyle Powell.

Novell's management didn't get this whole networking idea. But Noorda took the job, bought a piece of the company and launched NetWare in 1983. He was 59.

Within a few years, NetWare dominated the PC networking market, and Noorda was busy preaching another contradiction he called "coopetition." Rivals should cooperate on technical standards at the same time they compete on products, he said.

And even with Novell on top of its world, Noorda figured it couldn't last. By the early 1990s, Microsoft was making headway in networking. Noorda bought WordPerfect and Borland's Quattro Pro spreadsheet to compete with Microsoft Office, acquired the rights to Unix to give a next-generation NetWare a jump start and even launched a project to commercialize a new piece of software from another twentysomething: Linus Torvalds' Linux.

Once again, Novell's board didn't get it. But this time, Novell wasn't a failing little outfit — it was a big company with a lot to lose. The board pushed Noorda out as CEO in 1994. He was 70.

And he still wasn't done.

For the next few years, Noorda poured his billion-dollar fortune into Utah-based start-ups, many of which used Linux. At one point, Noorda's Canopy Group was the largest investor in Linux start-ups in the world. It was yet another contradiction: Noorda making money on free software.

Meanwhile, a visionless, rudderless Novell sold off Noorda's baffling acquisitions and then drifted downward for almost a decade under a series of CEOs until the company finally came up with a new strategy — based on, yes, Linux.

One of those CEOs was Eric Schmidt. Yes, the Eric Schmidt who left Novell in 2001 to become CEO at Google, a company built by a pair of twentysomethings with the idea that money could be found by searching the Internet. The Eric Schmidt who a few months ago bought an online word processor and spreadsheet so Google could compete with Microsoft Office.

The Eric Schmidt who just shelled out $1.65 billion for YouTube — another set of twentysomethings, another "How can they possibly make money?" idea.

It all sounds mighty familiar, doesn't it?

No, the business deep-thinkers don't get it. I admit, neither do I. But apparently Schmidt does. He has a plan. He sees how it can be done. And he doesn't mind baffling the rest of us.

And somewhere, Ray Noorda is laughing.

FRANK HAYES, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

Not the Answers We Needed

After four months on the job, this pilot fish checks his laptop's patch history and discovers it hasn't been updated since two days before he was hired. "There were 21 'critical' outstanding patches," says fish. "I checked a colleague's laptop – similar story, but she started 10 months ago." Fish asks IT support manager about the patching policy and is told all PCs are automatically updated overnight via the network. "I replied by pointing out that we're liable to disciplinary action if our laptops aren't locked away overnight," grumbles fish. "I have yet to receive a reply. One day, I'll check out my longest-serving colleague's laptop. She's had hers for over two years."

SHARK TANK

Personal Touch

This IT shop starts using a new online upgrade process with a vendor, and everything runs smoothly for months. But then there's a major snag, and a pilot fish has to dial the toll-free support number. Says fish, "After listening to my explanation of our problem, the tech asked, 'Can you type that up in an e-mail and send it to us, please?' He told me the e-mail address, and I sent the message. But I found the whole thing odd. Apparently, the only purpose of the help desk phone is to hand out that e-mail address."

Pass It Back

Frustrated IT pilot fish is fed up with the large number of passwords he has to keep track of – one for each major system, and all different. But he remembers that his company had a single-sign-on initiative just a few years before. "What ever happened to that?" he asks, using a Web page that lets employees anonymously send questions to management. "A few days later, I receive a call from a subhoncho in IT," fish reports. "The subhoncho references an anonymous submittal regarding password requirements and wants my opinion and advice on answering the question!"

Pass It On

New hire at this big company sends an e-mail to IT: "I am not sure which IT services organization this question should be directed to, but please forward the message if it is not yours. I am a new employee, and the person I replaced formerly had a printer. When I moved in, the printer and the computer were gone. Since I have a computer, I still need the printer to be returned, please." Sighs a pilot fish who got the message, "This was sent to well over a thousand people across the globe, ranging from help desk technicians to server engineers to IT executives. Yeah, sure, I'll start looking for your printer. . . ."

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